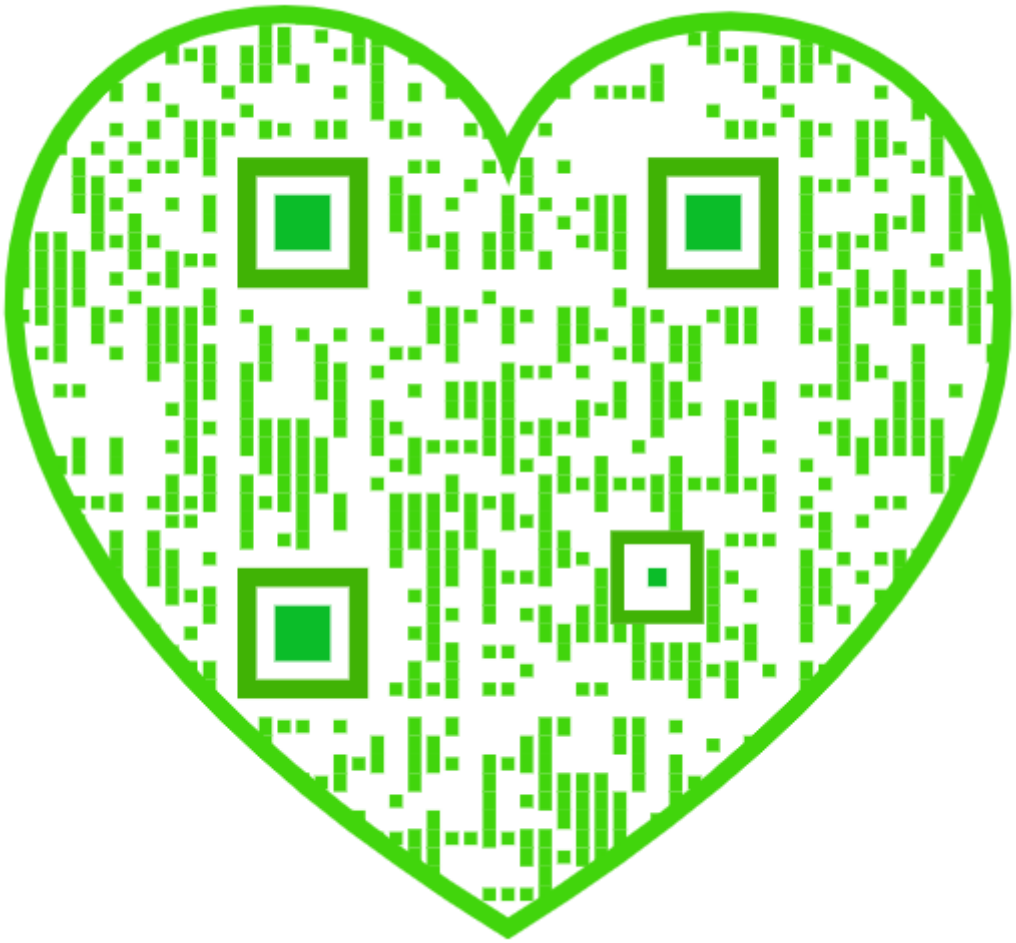

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EDITED BY

WILLIS LINN JEPSON

PROFESSOR OF BOTANY, UNIVERSITY OF CALIFORNIA

CONTENTS

PAGE

Historical Note on Carex Collection in California,
Willis Linn Jepson 5

A Monograph of the California Species of the genus Carex,
Kenneth K. Mackenzie 7

Index 93

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Issued February 2, 1922

A MONOGRAPH OF THE CALIFORNIA SPECIES OF THE GENUS CAREX

BY

KENNETH K. MACKENZIE

ILLUSTRATED WITH FIFTY-ONE DRAWINGS AND
ACCOMPANIED BY A NOTE ON THE HISTORY
OF CAREX EXPLORATION IN CALIFORNIA
BY W. L. JEPSON

THE UNIVERSITY OF CALIFORNIA PRESS
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CONTENTS

PAGE

Carex Exploration in California, an historical note 5

A Monograph of the California Species of the genus Carex 7

Index 93

CAREX EXPLORATION IN CALIFORNIA

AN HISTORICAL NOTE

By Willis Linn Jepson.

The earliest botanical explorers in California, beginning with Haenke and Menzies (1791 to 1794) and coming down to the time of Nuttall and Hartweg (1835 to 1845), either gave little attention to the collection of Carex or the records of their work are inadequate. The great folio work, the Reliquiæ Haenkeanæ of Presl, in which Haenke's California collections were described, does not record a single species of Carex from California. The indefatigable Douglas did not neglect Carex, but so far as the California supplement is concerned, the order Cyperaceæ is not mentioned in Hooker and Arnott's Botany of the Beechey. Bentham's Plantæ Hartwegianæ records two species as collected by Hartweg in the Sacramento valley.

The decades since the American occupation of California may be divided into three periods: the early or gold-discovery-period (1848 to 1874), in which the influence of the Pacific Railroad-Surveys and the California Geological Survey predominated; the middle period from 1875 to 1899, when members of the California Academy of Sciences took the lead in collecting; and the period of the botanical departments of the universities, during which time university-activities became enlarged and stabilized, that is, from 1900 to the present time.

During the gold-period resident botanists entered the field, and it is due to the exertions of these early explorers, that the knowledge of California Carices began to develop. Albert Kellogg, resident in the San Francisco bay region from 1849 until his death in 1887, devoted his leisure to the study and collection of the native flora. Among numerous other genera, Carex claimed his interest, and he collected many specimens of this genus. Geo. Thurber, attached to the Mexican Boundary Survey, collected at scattered points in the state in 1851 and 1852. As botanist of the Pacific Railroad Survey under Capt. Whipple, J. M. Bigelow traveled through the San Francisco bay region and the northern Sierra Nevada in 1854. A few Carices are found in his general collection. During the four years from 1861 to 1864 W. H. Brewer, botanist of the California Geological Survey, worked throughout the state. Specimens of Carex formed a substantial part of his collections, and Carex Breweri, a characteristic High Sierran species, was named for him by Boott.

In 1861 there arrived in California from Ohio the young botanist, Henry N. Bolander. Bolander was an unusual type of collector, both in method of collecting and in breadth of interests. He had a superior capacity for collecting seed-plants and at the same time was gifted with a keen eye for mosses and other cryptogams. In particular he was possessed of an unflagging interest in Graminales and was especially devoted to the sedges. While he collected widely through the state, his Carices were gathered mainly in Mendocino County, the San Francisco bay region and the central Sierra Nevada. His Carex specimens were excellent and will remain classical. The work that he did was commemorated by Olney in naming for him Carex Bolanderi, a species of the Yosemite region, where he worked so effectively. Bolander was active from the period of his arrival until about 1873, and succeeded Brewer as botanist of the California Geological Survey. Although Bolander published new species of Californian grasses, neither he nor Kellogg ventured to give names to any of their new species of Carex. In his "Catalogue of the plants growing in the vicinity of San Francisco" (1870), Bolander's special interest in Carex is, however, evident for he lists with habitat and locality thirty-five species.

During the middle period there were many collectors. J. S. Rothrock was attached to the Wheeler Survey as botanist and explored the region between Santa Barbara and Mt. Whitney in 1875. His gatherings included sedges. J. G. Lemmon made general collections (which included Carices) in the northern Sierra Nevada from 1875 to about 1882, and also in Southern California. Boott named Carex Lemmoni in his honor. S. B. Parish explored Southern California more thoroughly than any other botanist and always gave attention to Carex, both in the field and in the printed results of his studies. His activities date from about 1876 and have continued without interruption to the present time. Others to be named are E. L. Greene, T. S. Brandegee, and Alice Eastwood. W. R. Dudley stands out prominently, since he gave especial attention to Carex, both in the Coast Ranges and Sierra Nevada. In the latter part of this period M. S. Baker collected zealously in northeastern California, expecially in Shasta and Modoc counties, and found not a few sedges.

During the third period, H. M. Hall, L. R. Abrams and W. L. Jepson, in the course of general field work, collected Carex in various parts of California. In addition there have been many local resident collectors. J. P. Tracy has worked successfully in the Humboldt County area; B. C. Goldsmith made a collection in Siskiyou County especially for the research on this paper; L. S. Smith gathered a small collection in northeastern California; while A. L. Grant collected a considerable number of specimens in the Tuolumne and Fresno regions of the Sierra Nevada. A. A. Heller has collected with great zeal in many parts of California and has accumulated valuable material. Ezra Brainerd visited the Tahoe and Shasta regions in 1896 and collected good material in and around Strawberry Valley on the Placerville-Tahoe road and at Sisson. Five new species have been described from his collections.

The limits imposed by space do not permit the mention of the names of all who have contributed material to the preparation of Mr. Mackenzie's monograph, but the extent and success of their cooperation are revealed by the great additions which the author has made to our knowledge of the genus. William Boott, in volume two of the Botany of California, published in 1876, described seventy-eight species as occurring in California, while the present paper describes one hundred twenty-three. This increase in the number of known representatives of the genus does not, however, tell the full story. Knowledge of the forms is at present very much greater and the species here described are more accurately delimited than formerly. This increase in knowledge is directly related to the more abundant and more carefully prepared material which collectors now make it their object to secure, for it is only with long series of superior specimens that the labors of the monographer in so critical a genus may come to their full fruition.

A MONOGRAPH OF THE CALIFORNIA SPECIES OF THE GENUS CAREX

BY

KENNETH K. MACKENZIE

CAREX L. **Sedge.**

Grass-like sedges, perennial by rootstocks. Culms mostly triangular, often strongly phyllopodic or aphyllopodic. Leaves 3-ranked, the upper (bracts) elongate or short, and subtending the spikes of flowers or wanting. Plants monoecious or sometimes dioecious; flowers solitary in the axils of scales (glumes). Spikes one to many, either wholly pistillate, wholly staminate, androgynous or gynæcandrous, sessile or peduncled, the base of the pedunele often with a perigynium-like or spathe-like organ (elado-prophyllum) surrounding it. Perianth none. Staminate flowers of three (or rarely two) stamens, the filaments filiform. Pistillate flowers of a single pistil, with a style and two or three stigmas. Style either (1) jointed with the apiculate-tipped or rounded achene and withering and at length deciduous, or (2) continuous with achene, persistent, indurated and not withering. Achene 3-angled, lenticular or plano-convex, completely surrounded by the perigynium or rarely rupturing it in ripening. Rhacheola occasionally developed. Species more than 1000, all continents, but least developed in the tropics. (The classical Latin name, sometimes derived from the Greek, to cut, referring to the sharp leaf-blades of some species.)*

*All specimens cited have been examined. They are to be found in one or another of the following collections: Smithsonian Institution; University of California; Stanford University (including herbaria of S. B. Parish and W. R. Dudley); New York Botanical Garden; Harvard University; Ezra Brainerd; K. K. Mackenzie.

Much work remains to be done before there can be a full or complete understanding of the genus as developed in California. At the present time out of the 123 species recorded from the state 24 are known from but one collection and 5 more from but two collections. And in addition there is a considerable number of species recorded from adjoining states which have not yet been recorded from California.

In the bibliography will be found references to the papers of authors who have given any particular attention to Carex in California and also to a few general articles of special value.

The drawings are all original and were prepared under the direction of W. L. Jepson.

Bibliography

Bailey, L. H.—Untenable Names of Cariees in Bull. Torr. Club 11: 18-19—1884; Carex Catalogue 1-4—1884; Notes on Carex I in Bot. Gaz. 9: 117-122—1884; II in Bot. Gaz. 9: 137-141—1884; III in Bot. Gaz. 10: 203-208—1885; IV in Bot. Gaz. 10: 293-296—1885; V in Bot. Gaz. 10: 317-319—1885; VI in Bot. Gaz. 10: 379-382—1885; VII (Preliminary synopsis of North American Carices) in Proc. Am. Acad. 22: 59-157—1886; VIII in Bot. Gaz. 11: 328-330—1886; IX in Bot. Gaz. 13: 82-89—1888; X in Jour. Bot. 26: 321-323—1888; XI (Studies of the types of various species of the genus Carex) in Mem. Torr. Club 1: 1-85—1889; XII in Bull. Torr. Club 16: 218-220—1889; XIII in Bull. Torr. Club 17: 61-64—1890; XIV (Carex rigida Goodcn. and its varieties) in Jour. Bot. 28: 171-173—1890; XV in Proc. Cal. Acad. (ser. 2) 3; 104-6—1891; XVI in Bot. Gaz. 17: 148-153—1892; XVII in Bull. Torr. Club 20: 417-429—1893; XVIII in Bot. Gaz. 21: 1-8—1896; XIX in Bot. Gaz. 25: 270-272—1898; Carex in Coulter, Manual of the Plants of Western Texas in Contrib. U. S. Nat. Herb. 2: 476-484—1894; Carex in A. Gray Manual 6th ed. 587-622—1890; Carex in Coulter, Manual of the Botany of Rocky Mountain Region 370-397—1885; Carex Notes from the British Museum in Jour. Bot. 26: 321-323—1888; Untenable names of Carex in Bull. Torr. Club 11: 18-19—1884.

Boott, Francis—Carex in Hook. Fl. Bor. Am. 2: 207-228—1839; Articles on Carex in Linnaean Trans. 19: 215-220—1843; Jour. Bost. Nat. Hist. Soc. 5: 112-116—1845; Linnaean Trans. 20: 115-147—1845-6; Hooker's Jour. Bot. 5: 67-74—1846; Richardson's Arctic Expedition 463-471—1852; Pac. R. R. Rep. 4: 153-154—1856 (Bigelow collection); Illustrations of the Genus Carex, I—1858; II—1860; III—1862; IV—1867.

Boott, William—Carex in Wheeler's Survey 6: 276-281—1878; Carex in S. Wats. Bot. Cal. 2: 224-253—1880; articles in Proc. Am. Acad. 18: 172—1883 and in Bot. Gaz. 9: 85-94—1884.

Boeckler, Otto von—Articles in Flora 41: 649-651—1858; Linnaea 39: 14-152—1875; Linnaea 40: 327-452—1876; Linnaea 41: 145-339—1877; Flora 61: 39-41—1878; Flora 65: 59-64—1882; Engler's Bot. Jahrb. 7: 277-280—1886.

Brown, Robert—Carex in Supp. Appendix Parry's Voyage—1823; Carex in Bot. Appendix Richardson's Jour.—1823.

Carey, John—Carex in A. Gray Man. ed. 1, 535-567—1848; ed. 2, 507-535—1856; ed. 5 (with A. Gray) 571-602—1867.

Dewey, Chester—Carex in Wood's Class Book of Bot.—1845 and revised in subsequent editions; Carex in Bot. Mex. Bound. 229-232—1858; Caricography—Am. Jour. Sci., ser. 1, 7: 264-278—1824, (nos. 1-11); 8: 93-99—1824 (nos. 12-19); 8: 264-266—1824 (nos. 20-23); 9: 60-73—1825 (nos. 24-38); 9: 257-262—1825 (nos. 39-46); 10: 30-48—1826 (nos. 47-66); 10: 265-284—1826 (nos. 66-84); 11: 147-167—1826 (nos. 85-108); 11: 304-325—1826 (nos. 109-124); 12: 296-297—1827; 14: 351-354—1828 (nos. 125-126); 25: 140-146—1834 (nos. 127-129); 26: 107-108—1834 (nos. 130-131); 26: 376-378—1834 (nos. 132-136); 27: 236-241—1835 (nos. 137-144); 28: 270-276—1835; 29: 245-253—1836 (nos. 145-158); 30: 59-64—1836 (nos. 159-168); 39: 50-53—1840 (nos. 169-172); 43: 90-92—1842 (nos. 173-176); 48: 140-144—1845 (nos. 177-183); 49: 42-48—1845 (nos. 184-198); Am. Jour. Sci., ser. 2, 2: 245-249—1846 (nos. 199-205); 3: 171-173—1847 (nos. 206-208); 3: 354-356—1847 (nos. 209-212); 4: 343-350—1847 (nos. 213-226); 5: 172-176—1848 (nos. 227-234); 6: 244-245—1848 (nos. 234-236); 8: 348-350—1849 (nos. 237-240); 9: 29-30—1850 (nos. 241-242); 18: 102-104—1854 (nos. 243-245); 19: 252-256—1855 (nos. 246-249); 24: 46-48—1857 (nos. 250-253); 27: 78-81—1859 (nos. 254-256); 28: 231-232—1859 (nos. 257-259); 29: 346-348—1860 (nos. 260-264); 31: 23-26—1861 (nos. 265-270); 32: 38-41—1861 (nos. 271-276); 35: 57-60—1863 (nos. 277-280); 39: 69-73—1865 (nos. 281-285); 41: 226-230—1866 (nos. 286-292); 41: 326-331—1866 (nos. 293-298); 42: 243-245—1866 (nos. 299-303); 42: 325-334—1866 (Index).

Fernald, M. L.—Carex Blankinshipii in Erythea 7: 121-122—1899; Northeastern Carices of the Subsection Vesicariæ in Rhodora 3: 43-56—1901; Northeastern Carices of the Section Hyparrhenæ in Proc. Am. Acad. 37: 447-514—1902; various notes on Carex in Rhodora 2: 170-171—1900; Rhodora 3: 170-172—1901; Rhodora 4: 218-230—1902; Rhodora 5: 247-251—1903; Rhodora 8: 45-47; 73-77; 165-167; 181-184; 200-202—1906; Rhodora 9: 159-160—1907; Rhodora 10: 47-48—1908; Rhodora 12: 135-136—1910; Rhodora 13: 130, 243-248—1911; with K. M. Wiegand, Rhodora 14: 115-116—1912; Rhodora 15: 92-3; 133-134; 186-187—1913; Rhodora 16: 213-214—1914; Rhodora 17: 158-159—1915; Carex in A. Gray Manual (ed. 7), with B. L. Robinson, 204-256—1908.

Holm, T.—Studies in the Cyperaceæ I, Am. Jour. Sci. (4) 1: 348-350—1896; II (4) 2: 214-220—1896; III (4) 3: 121-128—1897; IV (4) 3: 429-437—1897; V (4) 4: 13-26—1897; VI (4) 4: 298-305—1897; VII (4) 5: 47:52—1898; VIII (4) 7: 5-12—1899; IX (4) 7: 171-183—1899; X (4) 7: 435-450—1899; XI (4) 8: 105-110—1899; XII (4) 9: 355-363—1900; XIII (4) 10: 33-47—1900; XIV (4) 10: 266-284—1900; XV (4) 11: 205-223—1901; XVI (4) 14: 57-63—1902; XVII (4) 14: 417-425—1902; XVIII (4) 15: 145-152—1903; XIX (4) 16: 17-44—1903; XX (4) 16: 445-464—1903; XXI (4) 17: 301-317—1904; XXII (4) 18: 12-22—1904; XXIII (4) 18: 301-307—1904; XXIV (4) 20: 301-306—1905; XXV (4) 23: 422-432—1907; XXVI (4) 26: 478-492—1908; Genus Carex in Northwest America in Bot. Centralbl. Beihefte, bd. 22, abt. 2, 1-29—1907.

Kükenthal, Georg—Carex in Engler, Pflzr. 4 20: 1-824—1909.

Mackenzie, Kenneth K.—Notes on Carex I in Bull. Torr. Club 33: 439-443—1906; II in Bull. Torr. Club 34: 151-155—1907; III in Bull. Torr. Club 34: 603-607—1907; IV in Bull. Torr. Club 35: 261-270—1908; V in Bull. Torr. Club 36: 477-484—1909; VI in Bull. Torr. Club 37: 231-250—1910; VII in Bull. Torr. Club 40: 529-554—1913; VIII in Bull. Torr. Club 42: 405-422—1915; IX in Bull. Torr. Club 42: 603-621—1915; X in Bull. Torr. Club 43: 423-434—1916; XI in Bull. Torr. Club 43: 601-620—1916; also articles in Muhlenbergia 5: 53-58—1909; Torreya 13: 14-16—1913; 14: 125-127; 155-159—1914; Proc. Biol. Soc. Wash. 25: 51-52—1912; Smithsonian Misc. Collections 65[7]: 1-3—1915; Carex in Rydberg, Rocky Mt. Flora 111-142—1917; Carex in Brit. & Brown, Ill. Flora (ed. 2) 1: 352-441—1913; Carex in Taylor, Flora of the Vicinity of New York 173-212—1915; Carex in Small & Carter, Flora of Lancaster Co., Pa. 47-64—1913.

Olney, Stephen T.—Caricos Novæ in Proc. Am. Acad. 7: 393-396—1868; Caricos Bor. Am. distributed in five fascicles with printed notes—1870; Carex in Hayden's Rep. 482-483—1871; Carex in Bot. King 361-375—1871; Caricos collected by E. Hall in Proc. Am. Acad. 8: 406-407—1872; Carex in Hall's Plantæ Texanæ, 25-27—1873; Caricos collected by Parry in Wyo. in Am. Nat. 8: 214—1874.

Parish, S. B.—Carex in Preliminary Synopsis of the Southern California Cyperaceæ, Bull. S. Cal. Acad. 4: 51-52; 66-68; 80-84; 106-114—1905; 5: 20-28; 36-37; 47-54—1906.

Schkuhr, Christian—Riedgraser—1801; Nachtrag oder die zweite halfte der Riedgraser —1806.

Schweinitz, Lewis D. von—Analytical Table in Ann. N. Y. Lyc. Nat. Hist. 1: 62-71—1824; Monograph of N. Am. Sp. of Carex (with J. Torrey) 1: 283-373—1825.

Torrey, John—Carex in Flora of Northern and Middle States 333-349—1826; Carex in Monograph of North American Cyperaceæ in Ann. N. Y. Lyc. Nat. Hist. 3: 386-427, 443—1836.

SYNOPSIS OF THE SPECIES

A. SPIKE ONE, ANDROGYNOUS, BRACTLESS; PERIGYNIA GLABROUS, BEAKED, THE BEAK WITH CLOSED SUTURE AT APEX DORSALLY.

Achenes triangular; stigmas three.
Pistillate scales persistent; perigynia inflated, sessile, not becoming reflexed....1. *Inflatæ.*
Pistillate scales deciduous; perigynia not inflated, stipitate, at least the lower reflexed at maturity....2. *Athrochlænæ.*
Achenes lenticular; stigmas two....3. *Capitatæ.*

B. SPIKES ONE TO MANY; IF ONE, NOT AS IN **A.**

1. ACHENES LENTICULAR AND STIGMAS TWO; LATERAL SPIKES SESSILE; TERMINAL SPIKE PARTLY PISTILLATE, OR IF STAMINATE THE LATERAL SPIKES SHORT OR HEADS DIOECIOUS.

Perigynia not white-puncticulate.
Rootstocks long-creeping, the culms arising singly or few together; perigynia with beak obliquely cut, at most bidentulate.
Spikes densely aggregated into a globose or ovoid head, appearing like one spike....4. *Fœtidæ.*
Spikes, at least the lower, distinct....5. *Divisæ.*
Cespitose or rootstocks short-creeping; perigynia obliquely cut to deeply bidentate.
Spikes androgynous (i. e., staminate flowers uppermost).
Perigynia abruptly contracted into the beak.
Spikes few (usually ten or less); perigynia green or tinged with reddish-brown....6. *Muhlenbergianæ.*
Spikes numerous; perigynia yellowish or brownish at flowering.
Perigynia yellowish; opaque part of leaf-sheath usually transversely rugulose....7. *Multifloræ.*
Perigynia brownish; opaque part of leaf-sheath not transversely rugulose....8. *Paniculatæ.*
Perigynia tapering into the beak....9. *Stenorhynchæ.*
Spikes gynæcandrous (i. e., pistillate flowers uppermost).
Perigynia at most thin-edged.
Perigynia spreading or ascending at maturity....10. *Stellulatæ.*
Perigynia appressed....11. *Deweyanæ.*
Perigynia narrowly to broadly wing-margined....12. *Ovales.*
Perigynia white-puncticulate....13. *Canescentes.*

2. ACHENES TRIANGULAR AND STIGMAS THREE, OR LENTICULAR AND STIGMAS TWO; IF LENTICULAR, LOWER LATERAL SPIKES CONSPICUOUSLY PEDUNCLED, OR TERMINAL SPIKE STAMINATE AND LATERAL SPIKES ELONGATED.

Staminate and pistillate spikes on different culms....17. *Scirpinæ.*
Staminate and pistillate spikes on the same culms.
Spike solitary.
Perigynia many-nerved, rounded and beakless at apex....14. *Polytrichoideæ.*
Perigynia 2-keeled, not rounded at apex, beakless or beaked.
Perigynia glabrous....15. *Firmiculmes.*
Perigynia pubescent or puberulent....16. *Filifoliæ.*
Spikes more than one.
Perigynia closely enveloping the achene, strongly tapering at base, pubescent or puberulent; bracts sheathless or nearly so....18. *Montanæ.*
Perigynia not as above; or if so, at least the lowest bract strongly sheathing.
Bracts (at least lowest) long-sheathing, more or less purplish-tinged, the blades absent or rudimentary....19. *Digitatæ.*

Lowest bract sheathless or long-sheathing; if long-sheathing its blade well-developed.
Lowest bract strongly sheathing; perigynia never strongly bidentate with stiff teeth.
Achenes lenticular; stigmas two.....20. *Bicolores.*
Achenes triangular; stigmas three.
Scales greenish or light reddish-brown or purplish tinged.
Rootstocks long-creeping; scales purplish tinged.....21. *Paniceæ.*
Rootstocks not long-creeping; scales greenish to reddish-brown tinged.
Perigynia glabrous or hispidulous; leaves not pubescent.
Pistillate spikes erect on stiff peduncles.....22. *Laxifloræ.*
Pistillate spikes slender on slender peduncles, the lower drooping.....24. *Debiles.*
Perigynia or leaves or both strongly pubescent.....23. *Triquetræ.*
Scales dark reddish-brown to blackish tinged.....25. *Frigidæ.*
Lowest bract sheathless or sheathing; if sheathing, perigynia strongly bidentate with stiff teeth.
Perigynia or leaves or both pubescent.....31. *Hirtæ.*
Neither perigynia nor leaves pubescent.
Style jointed with the achene, deciduous.
Achenes triangular; stigmas three.
Lowest bract sheathless; perigynia not bidentate.
Pistillate spikes narrowly cylindric, elongated. 26. *Anomalæ.*
Pistillate spikes ovoid, oblong or linear.....27. *Atratæ.*
Lowest bract sheathing; perigynia bidentate.....32. *Extensæ.*
Achenes lenticular; stigmas two.
Achenes not constricted in the middle.....28. *Acutæ.*
Achenes constricted in the middle; scales sharp-pointed, three-nerved.....29. *Cryptocarpæ.*
Style persistent, continuous with the achene.
Perigynia nerveless, except for the marginal nerves....30. *Trachychlænæ.*
Perigynia several-many-nerved.
Perigynia coarsely ribbed.....33. *Physocarpæ.*
Perigynia finely and closely ribbed.....34. *Pseudo-cyperæ.*

1. Inflatæ.

Scales 1-nerved; perigynia ovoid, inflated, tapering at apex; staminate part of spike scarcely conspicuous; achenes 1.25 mm. long.....1. *C. Engelmannii.*

Scales 3-nerved; perigynia broadly ovoid, strongly inflated, very abruptly short-beaked; staminate part of spike conspicuous; achenes 2 mm. long.....2. *C. Breweri.*

2. Athrochlænæ.

Represented by one species in our range.....3. *C. nigricans.*

3. Capitatæ.

Represented by one species.....4. *C. capitata.*

4. Fœtidæ.

Represented by one species in our range.....5. *C. vernacula.*

5. Divisæ.

Rootstocks slender, light brownish; culms obtusely triangular, normally smooth; leaf-blades narrow, involute.....6. *C. Douglasii.*

Rootstocks stout; culms acutely triangular, normally rough above.
Perigynia chestnut, thick, the beak about one-fifth as long as the body.....7. *C. simulata.*
Perigynia blackish in age, the beak one-third to one-half as long as the body.
Scales very dark chestnut-brown, shining; perigynia 3.5–4.5 mm. long, polished, scarcely hyaline at orifice.....8. *C. pansa.*
Scales lighter colored, dull; perigynia 3–4 mm. long, dull, strongly hyaline at orifice.....9. *C. prægracilis.*

6. Muhlenbergianæ.

Densely cespitose; head orbicular or oblong-ovoid.....10. *C. Hoodii.*

Rootstocks elongate; head linear, interrupted.....11. *C. tumulicola.*

7. Multifloræ.

Scales strongly hyaline-margined; sheaths normally not cross-rugulose.
Perigynia lanceolate-ovate, sharp-margined to base, membranaceous, straw-colored.....12. *C. stenoptera.*
Perigynia ovate, truncate at base, short-beaked, sharp-margined above, not membranaceous, brownish-black at maturity.....13. *C. alma.*
Scales not strongly hyaline-margined; sheaths normally more or less cross-rugulose; perigynia straw-colored, yellowish or tawny at maturity, sharp-margined to base.
Perigynia 3.5-4.5 mm. long, the beak much shorter than the body; pistillate scales (except lowest) acute or cuspidate.
Scales brownish-tinged; perigynia ascending at maturity, stramineous or brownish-tinged, the ventral face low convex, strongly nerved, more or less abruptly beaked.....14. *C. densa.*
Scales reddish-brown tinged; perigynia spreading at maturity, reddish tinged, the ventral face flat, nerveless or nearly so, less abruptly beaked.....15. *C. vicaria.*
Perigynia 2.25-3.25 mm. long, the beak about length of the body; pistillate scales strongly awned.....16. *C. Dudleyi.*

8. Paniculatæ.

Leaf-blades 1.25 mm. wide; head little interrupted; perigynia 2-2.75 mm. long, shining, not concealed by the scales.....17. *C. diandra.*
Leaf-blades 2.5-6 mm. wide; head interrupted, compound; perigynia 3-4 mm. long, dull, concealed by the scales.....18. *C. Cusickii.*

9. Stenorhynchæ.

Perigynia 3-4 mm. long, the beak much shorter than the body; scales strongly dark-tinged.
Leaves clustered at base; sheaths not cross-rugulose ventrally; culms slender.....19. *C. Jonesii.*
Leaves not clustered at base; sheaths cross-rugulose ventrally; culms stout.....20. *C. nervina.*
Perigynia 4-6 mm. long, the beak longer than the body; scales not dark-tinged.....21. *C. stipata.*

10. Stellulatæ.

Spikes more or less widely separate, not brownish-black.
Body of perigynium broadest near middle; beak with few weak serrulations.....22. *C. læviculmis.*
Body of perigynium broadest near base; beak strongly serrulate.
Beak of perigynium bluntly bidentate, ¼-⅓ length of body, the ventral suture obsolete or inconspicuous; scale obtuse, ½ length of body of perigynium.....23. *C. interior.*
Beak of perigynium sharply bidentate, the ventral suture conspicuous.
Beak of perigynium chestnut-brown tipped; culms obtusely triangular; pistillate scales obtuse or obtusish, chestnut-brown tinged with broad shining margins and apex, rounded and not keeled, the midvein obscure at apex.
Spikes widely separate, the terminal long-clavate; perigynia 3.5-4 mm. long.....24. *C. ormantha.*
Spikes approximate, the terminal short-clavate; perigynia 3.75-4.5 mm. long.....25. *C. phyllomanica.*
Beak of perigynium reddish-brown tipped; culms sharply triangular; pistillate scales obtusish to cuspidate, yellowish-brown tinged, the margins and apex narrow, opaque or dull whitish, keeled with the sharp midvein which is prominent to apex.....26. *C. angustior.*
Spikes in a small (6-10 mm. long), densely capitate, brownish-black head.....27. *C. illota.*

11. Deweyanæ.

Perigynia shallowly bidentate, 3.5-4 mm. long, the beak about ⅓ length of body.....28. *C. leptopoda.*
Perigynia deeply bidentate, 4-4.5 mm. long, the beak about ½ length of body.....29. *C. Bolanderi.*

12. Ovales.

Sheaths green-striate opposite blades, except at mouth.....30. *C. feta.*
Sheaths white-hyaline opposite blades.
Sheaths strongly prolonged upward at mouth opposite blade in a very membranaceous appendage; perigynia and scales greenish.....31. *C. fracta.*
Upper sheaths (at least) concave or truncate at mouth opposite blades.
Beak of perigynium flat and serrulate to strongly bidentate tip.
Perigynia 3.5-5 mm. long, 2-3 mm. wide.
Perigynia thin with margins conspicuously wrinkled dorsally; culms 1-4 dm. high; spikes ovoid, densely capitate.....32. *C. straminiformis.*
Perigynia thick with margins not wrinkled dorsally; culms 3-9 dm. high; spikes oblong in an oblong head.....33. *C. multicostata.*
Perigynia 3-3.5 mm. long, 1-1.5 mm. wide.....34. *C. subfusca.*

Beak of perigynium terete toward apex, the upper 1-3 mm. smooth or nearly so.
Perigynia appressed, nearly or entirely covered by scales, the beaks not conspicuous in the spikes.
Culms slender; spikes in a flexuous nodding head.....35. *C. praticola.*
Culms stiff; spikes approximate in an erect head.
Culms 1-6 dm. high, the leaves not bunched near base; blades 2-3 mm. wide, flat; beak of perigynium not hyaline at orifice. 36. *C. Tracyi.*
Culms 1-3 dm. high, the leaves bunched near base; blades 1.5-2 mm. wide, more or less involute; perigynium beak hyaline at orifice.
Perigynia oblong-ovate, rather strongly margined.....37. *C. phæocephala.*
Perigynia linear-lanceolate, very narrowly margined, boat-shaped.....38. *C. leporinella.*
Upper part of perigynia conspicuous in the spikes, not covered by scales.
Perigynia lanceolate, 5.5-8.5 mm. in length, 3-5 times as long as wide.
Spikes about three, not capitate; scales little more than ½ length of perigynia.....39. *C. Davyi.*
Spikes 6-12, capitate; scales equaling bodies of perigynia.....40. *C. specifica.*
Perigynia ovate or if lanceolate shorter than 5.5 mm. in length.
Lower bracts leaflet-like, much exceeding head.
Perigynia strongly nerved ventrally, the beak ferruginous at orifice, bidentate.....41. *C. unilateralis.*
Perigynia obscurely nerved ventrally, the beak hyaline at orifice, bidentulate.....42. *C. athrostachya.*
Lower bracts scale-like, much shorter than or slightly exceeding head.
Perigynia with membranaceous or submembranaceous walls.
Perigynia thin and flat save where distended by achene.
Perigynia 3.5-5 mm. long; culms slender.....43. *C. festivella.*
Perigynia 4.5-6 mm. long; culms low, ascending or decumbent.....44. *C. nubicola.*
Perigynia strongly plano-convex at maturity.
Perigynia nerveless ventrally or with impressed nerves.....45. *C. pachystachya.*
Perigynia with conspicuous raised nerves on inner face.
Perigynia conspicuously hyaline-tipped; spikes densely capitate.....46. *C. abrupta.*
Perigynia reddish-tipped; spikes more or less strongly separate.....47. *C. mariposana.*
Perigynia with thick, firm walls.
Perigynia very small (2.25-3.5 mm. long).
Margins of perigynia entire (or very obscurely subserrulate).....48. *C. integra.*
Margins of perigynia strongly serrulate.....49. *C. teneræformis.*
Perigynia longer (3.5 mm. long or more).
Lower bracts (at least) strongly amplectant; beaks of perigynia and scales little reddish-tinged.....50. *C. amplectens.*
Bracts not amplectant; beaks of perigynia and scales strongly reddish-tinged.
Perigynia strongly nerved ventrally, the nerves prominent.....51. *C. Harfordii.*
Perigynia nerveless or very obscurely nerved ventrally.
Perigynia with a few raised nerves dorsally; coastal species.
Spikes strongly capitate; leaf-blades averaging 2.5-3 mm. wide; culms 3.5-12 dm. high.....52. *C. sub-bracteata.*
Spikes not capitate, the head slender; leaf-blades averaging 1.5-2 mm. wide; culms 1-6 dm. high.....53. *C. gracilior.*
Perigynia many-striate or with impressed nerves dorsally; species of the Sierra Nevada.
Spikes not few-flowered; culms slender; leaves not clustered, the blades elongated.....54. *C. pachycarpa.*
Spikes 6-12-flowered; culms stiff; leaves clustered, the blades short.....55. *C pauci fructus.*

13. Canescentes.

Spikes androgynous; perigynia unequally biconvex.....56. *C. disperma.*
Spikes gynæcandrous; perigynia plano-convex.
Perigynia broadest near middle, short-beaked, smooth or little roughened.....57. *C. canescens.*
Perigynia ovate, broadest near the base; beak conspicuous, strongly serrulate.....58. *C. arcta.*

14. Polytrichoideæ.

Represented by one species.....59. *C. leptalea.*

15. Firmiculmes.

Not stoloniferous; culms smooth, terete; leaf-blades 1.5 mm. wide; bracts long-awned.....60. *C. multicaulis.*
Stoloniferous; culms very rough, triangular; leaf-blades 2-3.5 mm. wide; bracts not long-cuspidate.....61. *C. Geyeri.*

16. Filifoliæ.

Represented by one species in our range.....62. *C. exserta.*

17. Scirpinæ.

Represented by one species in our range.....63. *C. gigas.*

18. Montanæ.

Basal spikes not developed.....64. *C. inops.*
Basal spikes present.
Perigynia finely many-ribbed as well as strongly 2-keeled.
Scales purplish-tinged, obtuse to cuspidate; body of perigynium globose; staminate spikes many-flowered; basal pistillate spikes on elongated very slender peduncles.....65. *C. globosa.*
Scales reddish-brown tinged, cuspidate or long-awned; body of perigynium oval; staminate spikes few-flowered; basal pistillate spikes on short, erect peduncles..66. *C. Brainerdii.*
Perigynia strongly 2-keeled, otherwise nerveless.
Bract of lowest non-basal pistillate spike leaflet-like, exceeding culm, if at all colored, purplish-brown tinged at base.
Perigynia 2.5-3 mm. long, the beak 0.25-0.75 mm. long, shallowly bidentate.....67. *C. brevipes.*
Perigynia 3-4.5 mm. long, the beak 0.75-1.50 mm. long, bidentate.....68. *C. Rossii.*
Bract of lowest non-basal pistillate spike squamiform and shorter than culm or, if longer, auriculate and strongly reddish-brown tinged at base.....69. *C. brevicaulis.*

19. Digitatæ.

Represented by one species in our range.....70. *C. concinnoides.*

20. Bicolores.

Perigynia short-tapering at apex, straw-colored, 2.5-3.75 mm. long.....71. *C. salinæformis.*
Perigynia rounded or truncate at apex, orange-colored or white-pulverulent, smaller.
Mature perigynia whitish, ellipsoidal, not fleshy or translucent.....72. *C. Hassei.*
Mature perigynia orange or brownish, broader, fleshy or translucent.....73. *C. aurea.*

21. Paniceæ.

Perigynia beakless or nearly so; bract sheaths short; plant glaucous; leaf-blades narrow, involute.....74. *C. livida.*
Perigynia strongly beaked; bract sheaths long; plant not glaucous; leaf-blades broad, flat.....75. *C. californica.*

22. Laxifloræ.

Represented by one species in our range.....76. *C. Hendersonii.*

23. Triquetræ.

Lowest bract sheathless or very short-sheathing; spikes approximate; perigynia glabrous, strongly ribbed or nerved.....77. *C. Whitneyi.*
Lowest bract long-sheathing; lower spikes more or less strongly separate; perigynia hairy, faintly nerved or nerveless.
Leaf-blades hairy; spikes oblong or short-oblong, the upper approximate.
Perigynia 4-5 mm. long, round-tapering at base, finely many-nerved.....78. *C. gynodynama.*
Perigynia 3.5-4 mm. long, tapering at base, 2-keeled, obscurely striate.....79. *C. hirtissima.*
Leaf-blades not hairy; pistillate spikes linear, widely separate.....80. *C. triquetra.*

24. Debiles.

Represented by one species in our range.....81. *C. mendocinensis.*

25. Frigidæ.

Perigynia triangular or slightly flattened, the beak bidentulate; scales obtusish, the midvein not prominent at apex.
Spikes widely separate, the staminate one strongly overtopping the uppermost pistillate one; perigynia triangular, 3.5 mm. long or less; lower bracts with conspicuous blades.....82. *C. Lemmonii.*
Uppermost pistillate spikes bunched, little exceeded by the staminate one; perigynia compressed-triangular, longer; bracts with rudimentary blades.
Pistillate spikes oblong; scales reddish-brown.....83. *C. luzulina.*
Pistillate spikes linear-oblong; scales dark-tinged.....84. *C. ablata.*
Perigynia strongly flattened, the beak bidentate; scales sharp-pointed with midvein prominent to apex.
Perigynia glabrous; scales smooth; bract sheaths strongly enlarged upward; leaf-blades very leathery.....85. *C. luzulæfolia.*
Perigynia sparsely hairy; scales more or less hairy; bract sheaths scarcely enlarged upward; leaf-blades not leathery.....86. *C. fissuricola.*

26. Anomalæ.

Represented by one species in our range.....87. *C. amplifolia.*

27. Atratæ.

Terminal spike staminate or sometimes with perigynia in the middle.
Basal sheaths not filamentose.
Culms few-leaved, strongly aphyllopodic.....88. *C. spectabilis.*
Culms many-leaved, clothed at base with dried-up leaves of previous year.....89. *C. Raynoldsii.*
Basal sheaths filamentose.....90. *C. bifida.*
Terminal spike gynæcandrous; i. e., the terminal flowers pistillate.
Culms aphyllopodic, strongly purplish-red at base, the lower sheaths filamentose.....91. *C. Buxbaumii.*
Culms phyllopodic.
Spikes 3-5, not oblong-cylindric; perigynia walls not papery; perigynia 2.5-4.5 mm. long, nerveless or obscurely nerved on face, dull green to brownish-black.
Perigynia not papillate-roughened.
Spikes contiguous, sessile or nearly so, forming a dense head; scales lanceolate, strongly exceeding perigynia; culms stiff, erect.....92. *C. Helleri.*
Lower spike or spikes more or less peduncled, usually distant, erect or nodding; scales wider, shorter than or about equaling perigynia; culms more slender.
Scales with midvein largely obsolete; mature perigynia 3.5-4.5 mm. long, wider on either side than achene, the latter on stipe of nearly its own length; sheaths not purplish-tinged ventrally.....93. *C. epapillosa.*
Scales with prominent midvein; mature perigynia 3.5 mm. long, narrower on either side than achene, the latter much longer than its stipe; sheaths normally purplish-tinged ventrally.....94. *C. heteroneura.*
Perigynia papillate-roughened, especially on upper margins.....95. *C. albo-nigra.*
Spikes 6-10, oblong-cylindric; perigynia 5 mm. long, lightly 3-nerved, light green, the walls papery; scales much shorter than perigynia.....96. *C. Mertensii.*

28. Acutæ.

I. Flowering culms arising from the center of previous year's tuft of leaves and surrounded at base with dried-up leaves of previous year.

A. Lower sheaths of flowering culms not breaking and becoming filamentose.

Strongly stoloniferous, the culms arising one-few together, low; lowest bract normally much shorter than inflorescence; scales with obsolete or slender midvein.

Dried first year leaf-blades at base of fertile culms stiff, rigid and conspicuous, concealing the culms; fertile culm leaves all blade-bearing, the lower sheaths not purplish or hispidulous dorsally.....97. *C. scopulorum.*

Dried first year leaf-blades at base of fertile culms much desiccated, not stiff, rigid or conspicuous, and not concealing the culms; lowest fertile culm leaves not blade-bearing, the lower sheaths purplish and more or less strongly hispidulous dorsally.....98. *C. gymnoclada.*

Culms taller, less stiff, in larger clumps; lowest bract equaling or exceeding inflorescence; scales with slender midvein or broader light colored center.

Perigynia strongly nerved ventrally, the nerves raised.

Perigynia coriaceous, sessile or nearly so, the beak bidentate; strongly stoloniferous.....99. *C. nebraskensis.*

Perigynia membranaceous, more or less slenderly stipitate, the beak entire; cespitose.

Perigynia substipitate, orbicular, minutely papillate-roughened; scales deciduous.....100. *C. paucicostata.*

Perigynia strongly stipitate, ovate.

Perigynia yellowish-green, ribbed, papillate-roughened; scales deciduous.....101. *C. Hindsii.*

Perigynia light green or in age glaucous green, nerved, very minutely granular; scales long persistent.....102. *C. Kelloggii.*

Perigynia nerveless ventrally or with obscure impressed nerves.

Sheaths colored ventrally at mouth; lower pistillate spikes subcernuous on long peduncles; scales in age whitened at tip.....103. *C. sitchensis.*

Sheaths not colored ventrally at mouth; lower pistillate spikes not nodding; scales not whitened at tip.....104. *C. aquatilis.*

B. Lower sheaths of flowering culms breaking and becoming filamentose.

Beak of perigynium bidentate, hispidulous between teeth; scales strongly rough-awned.....105. *C. barbaræ.*

Beak of perigynium entire or emarginate, not hispidulous between teeth; scales not rough-awned.

Lower culm sheaths strongly yellowish-brown tinged, sharply keeled; culms stout, the leaf-blades 6-12 mm. wide.....106. *C. Schottii.*

Lower culm sheaths purplish-tinged, not sharply keeled; culms more slender, the leaf-blades narrower.....107. *C. senta.*

II. Some or all of the flowering culms arising laterally and not enveloped at base by previous year's tuft of leaves.

Culms very densely cespitose, forming dense stools; lowest sheaths strongly filamentose; lowest bract little developed, usually much exceeded by inflorescence.....108. *C. nudata.*

Culms much less densely cespitose, forming beds, conspicuously stoloniferous; lowest bract well-developed from somewhat shorter-than to exceeding inflorescence.

Perigynia orbicular or nearly so.....109. *C. eurycarpa.*

Perigynia oblanceolate.....110. *C. oxycarpa.*

29. Cryptocarpæ.

Perigynia dull, straw-colored or light brown, slightly granular; lower sheaths of sterile shoots not filamentose.....111. *C. Lyngbyei.*

Perigynia shining, brown, smooth; lower sheaths of sterile shoots strongly filamentose..112. *C. obnupta.*

30. Trachychlænæ.

Represented by one species in our range.....113. *C. spissa.*

31. Hirtæ.

Beak of perigynium obliquely cut, shallowly bidentate at maturity; foliage pubescent; staminate scales long ciliate.....114. *C. yosemitana.*

Beak of perigynium deeply bidentate; staminate scales at most erose.

Foliage not pubescent; teeth of perigynium beak short.

Lowest bract strongly sheathing; fertile culms phyllopodic with many leaves, the sheaths not breaking and becoming filamentose.....115. *C. oregonensis.*

Lowest bract not sheathing; fertile culms aphyllopodic with few leaves, the sheaths breaking and becoming filamentose.....116. *C. lanuginosa.*

Sheaths and under surface of leaf-blades hairy; teeth of perigynium beak conspicuous.....117. *C. Sheldonii.*

32. Extensæ.

Represented by one species in our range.....118. *C. viridula.*

33. Physocarpæ.

Perigynia ascending; lower sheaths more or less strongly filamentose; culms sharply triangular.

Perigynia 5-8 mm. long, abruptly contracted into beak.....119. *C. vesicaria.*

Perigynia 7-10 mm. long, tapering into beak.....120. *C. exsiccata.*

Perigynia spreading at maturity; lower sheaths not filamentose; culms bluntly triangular below spikes.....121. *C. rostrata.*

34. Pseudo-Cypereæ.

Perigynia suborbicular in cross-section, more or less inflated; teeth of perigynium beak 0.5-1 mm. long.....122. *C. hystricina.*

Perigynia obtusely triangular, scarcely inflated, closely enveloping achene; teeth of perigynium beak 1.5-2 mm. long, recurved or spreading.....123. *C. comosa.*

DIAGNOSES OF THE SPECIES

WITH INDICATIONS OF RANGE, CITATIONS OF LOCALITIES, AND REFERENCES TO THE LITERATURE

I. Inflatæ Kük. Cespitose, the rootstocks elongate. Leaf-blades filiform. Spike solitary, ovoid, androgynous, densely flowered, bractless. Perigynia inflated, the walls very thin, slightly nerved, sessile, the smooth beak hyaline-tipped, obliquely cut, in age bidentulate. Achenes triangular. Style very slender, straight, jointed with achene, deciduous. Stigmas 3.

1. **C. Engelmannii** Bailey. Rootstocks slender, tough, elongate, the culms 5-20 cm. high, smooth, brownish tinged at base; leaf-blades filiform, 0.3-0.5 mm. wide, 3-15 cm. long, smooth or nearly so, the sheaths loose, many-striate; spike 10-15 mm. long, 6-10 mm. wide, the lower ¾ pistillate with 15-40 ascending perigynia; scales 1-nerved, acute to cuspidate, all except lower shorter than perigynia; perigynia ovoid, 4.5-5 mm. long, 2.25 mm. wide, rounded at base, inflated, nerveless, glabrous, chartaceous, tapering at apex into a minute smooth beak, 0.5 mm. long; achenes 1.25 mm. long.

Type Locality: Colorado, probably near Colorado Springs (Engelmann).

Southern Sierra Nevada. Colorado to Washington.

Locs.: Kaweah Peaks, *Dudley* 2215; Kokopo Creek, *Dudley* 2447; Chagoopa Meadows, *Dudley* 2272; Camp Alta, *Dudley* 989.

Refs.: Carex Engelmannii Bailey, Proc. Am. Acad. 22: 132 (1886); Kük. in Engler, Pflzr. 4[20]: 96 (1909). *C. paddoënsis* Suksdorf, Allg. Bot. Zeit Schr. 12: 43 (1906), type from Mt. Paddo (Adams), Washington.

2. **C. Breweri** Boott. (Fig. 1). Rootstocks tough, elongate, the culms 1-2.5 dm. high, smooth, brownish tinged at base; leaf-blades filiform but rigid, 5-10 cm. long, less than 1 mm. wide, the sheaths loose, many striate and scarious; spike 10-15 (or 20) mm. long, 6-10 mm. wide, the upper third staminate; scales ovate, short-acuminate, 3-nerved, narrower and shorter than perigynia; perigynia broadly ovoid, 5 mm. long, 3.5 mm. wide, rounded at base, strongly inflated, nerveless, glabrous, the walls very thin, abruptly beaked, the smooth beak 0.5-1 mm. long, obliquely cut, at length bidentulate; achenes 2 mm. long.

Type Locality: Mt. Shasta, California (Brewer 1422).

High Alpine peaks, Washington and Oregon, and south as far as Mt. Whitney on the higher summits of the Sierra Nevada in California.

Locs.: Mt. Shasta, *Brewer* 1391, 1392, 1422, *Hooker & Gray, Pringle, Goodale, Copeland* 3517, *Jepson;* Mt. Dana, *Brewer* 1863, *Bolander* 2176, *Congdon;* head of San Joaquin, *Brewer* 2831; James Peak, *Brewer* 2176; Sawtooth Peak, Tulare Co., *Hall & Babcock* 5680; Mt. Whitney, *Coville & Funston* 1669, *Jepson* 1085; Alta Meadows, Tulare Co., *Geo. B. Grant;* Alta Peak, Tulare Co., *Dudley* 1532 (in part), 1536.

Refs.: Carex Breweri Boott, Ill. Carex 4: 142, pl. 455 (1867); W. Boott in Bot. Cal. 2: 229 (1880); Kük. in Engler, Pflzr. 4[20]: 96 (1909).

II. Athrochlænæ Holm. Cespitose or with creeping rootstocks. Leaf-blades narrow. Spike solitary, androgynous, bractless, narrow, densely many-flowered. Pistillate scales soon falling. Perigynia slenderly strongly stipitate, widely spreading or the lower reflexed, obscurely triangular, nerveless, membranaceous, long-beaked, the beak obliquely cut, becoming bidentulate. Achenes usually triangular, slightly apiculate. Style very slender, straight, slightly enlarged upward, jointed with achene, deciduous. Stigmas 3 or occasionally 2.

FIG. 1. CAREX BREWERI Boott.

a, habit, × 2/3; *b*, scale, × 5; *c*, perigynium, × 5.

FIG. 2. CAREX NIGRICANS Meyer.

a, habit, × 2/3; *b*, inflorescence, × 2/3; *c*, scale, × 4; *d*, perigynium, × 4.

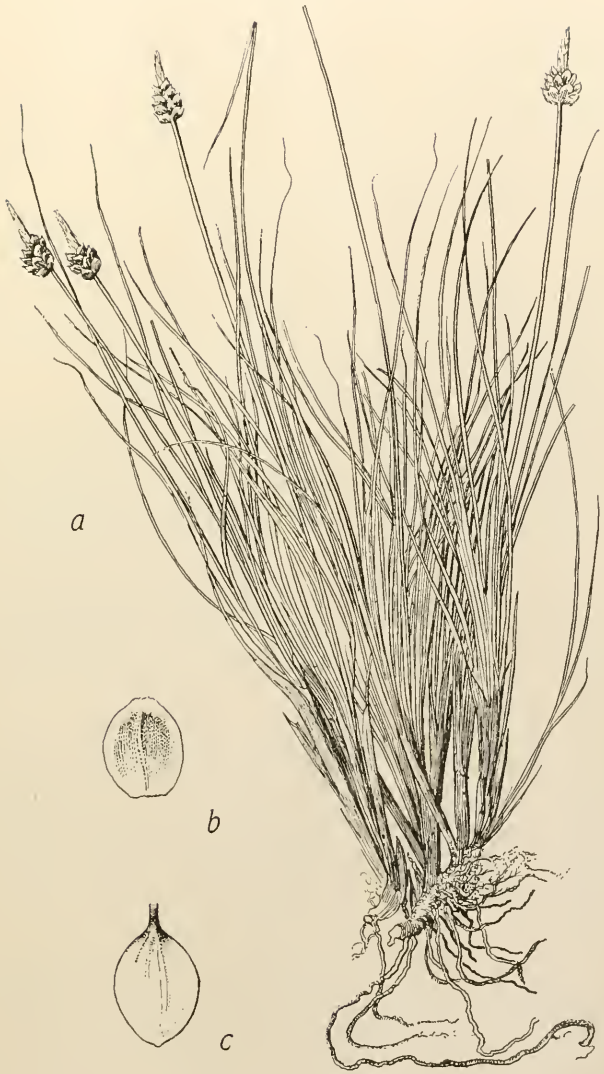

FIG. 3. CAREX CAPITATA L.

a, habit, × 1; *b*, scale, × 8; *c*, perigynium, × 8.

3. C. nigricans C. A. Meyer. (Fig. 2.) Rootstocks stout, lignescent, creeping, the culms 5-20 cm. high, stiff, firm, smooth, exceeding leaves, brownish tinged at base; leaves 4-9 to a fertile culm, the blades 4-10 cm. long, 1.5-3 mm. wide, flat, or channeled at base, attenuate at apex; spike 8-15 mm. long, 6-9 mm. wide, the upper half staminate, the lower with 10-25 perigynia; scales ovate, obtuse to acutish, dark-brown tinged with hyaline margins, ½ to nearly as long as perigynia; perigynia 4 mm. long, 1 mm. wide, compressed-orbicular in cross-section, brownish, nerveless, glabrous, rounded and strongly stipitate at base, at maturity deflexed, tapering into a smooth beak with obliquely cut hyaline orifice.

Type Locality: "Habitat in Unalaschka."

Arctic alpine from Colorado and California northward to Alberta and Alaska. In California it is confined to the Sierra Nevada, where it is known to extend from Tulare Co. to Lake Tahoe.

Locs.: Minarets, *Congdon;* Devil Basin, El Dorado Co., *Brainerd;* Lake Lucille, *Hall & Chandler* 4664; *Brewer* 1379 (referred to *C. pyrenaica* Wahl. in Bot. Cal.); Tuolumne, *Dudley*; Marble Cañon, Tulare Co., *Dudley* 1281; Black Peak, Tulare Co., *Dudley* 2131, 2133; Mt. Silliman, Tulare Co., *Dudley* 1503; Lake Tahoe, *Abrams* 4862; Vogelsang Pass, *Jepson* 3238.

Ref.: Carex nigricans C. A. Mey. Mem. Acad. St. Petersb. 1: 211, pl. 7 (1831); Kük. in Engler, Pflzr. 4[20]: 106 (1909). "*C. pyrenaica* Wahl." W. Boott in Bot. Cal. 2: 228 (1880).

In Bot. Cal., *Brewer* 1379 was erroneously referred to *C. pyrenaica* Wahl., a species which may possibly yet be found in California. *C. pyrenaica* has densely cespitose culms, each with but 2 or 3 leaves with involute blades 1 mm. wide or less; the staminate flowers are few and the perigynia are erect until full maturity.

III. Capitatæ Christ. Cespitose, the rootstocks somewhat elongate. Leaf-blades filiform. Spike solitary, ovoid, androgynous, densely flowered, bractless. Perigynia plano-convex, sharp edged, not inflated, essentially nerveless, sessile, the walls thinnish, the smooth terete beak conspicuously hyaline-tipped, in age bidentulate. Achenes lenticular, apiculate. Style straight, slender, jointed with achene, at length deciduous. Stigmas 2.

4. C. capitata L. (Fig. 3.) Rootstocks slightly elongate, the culms cespitose, 1-3.5 dm. high, erect, roughish above, the basal sheaths purplish, sparingly filamentose; leaf-blades about 0.5 mm. wide, rigid, stiff, shorter or longer than culm; spike orbicular or oblong-orbicular, 4-8 (or 10) mm. long, 3-6 mm. wide, with 6-25 ascending perigynia below and a short but conspicuous cone of staminate flowers above; scales ovate-orbicular, obtuse, shorter and narrower than perigynia, chestnut-brown with broad hyaline margins; perigynia 2-2.5 mm. long and rather narrower, ovoid, plano-convex, pale green, smooth, nerveless, rounded at base, abruptly beaked, the beak smooth, slender, dark-colored, less than 1 mm. long, at length bidentulate.

Type Locality: Northern Europe (Fl. Dan. pl. 372).

An arctic-alpine species found from Greenaland to Alaska and also occurring very locally on mountain summits southward: New Hampshire, Alberta, Nevada, California, Mexico. In California it is reported only from the Sierra Nevada at altitudes of 6500 feet and more, in Tulare and Fresno counties.

Locs.: Mt. Goddard, *Hall & Chandler* 673; Kaweah Meadow, Tulare Co., *Dudley* 2216; Chagoopa Creek Meadow, Tulare Co., *Dudley* 2275.

Refs.: Carex capitata L. Syst. Nat. (ed. 10) 1261 (1759); Kük. in Engler Pflzr. 4[20]: 70 (1909).

IV. Fœtidæ Tuckerm. Rootstocks elongate, dark-colored, the culms arising singly or a few together. Leaf-blades narrow. Spikes few to several, androgynous, aggregated into a dense subglobose or ovoid head. Perigynia spreading, plano-convex, membraneous, usually obsoletely nerved, loosely enveloping the achene, rounded at base, stipitate, the beak obliquely cut, at times bidentulate. Achenes lenticular. Style slender, jointed with achene, deciduous. Stigmas 2.

5. C. vernacula Bailey. (Fig. 4.) Rootstocks creeping, lignescent, the culms in small clumps 1-2 dm. high, usually exceeding leaves, smooth; leaf-blades 5-12 cm. long, 2-4 mm. wide, stiff; head very dense, orbicular, about 1 cm. in diameter, the spikes not distinguishable, the staminate flowers inconspicuous; scales ovate, brown, sharp-pointed, rather wider and from shorter to longer than perigynia; perigynia ovoid, 3.5-4 mm. long, 1.5 mm. wide, scarcely inflated, not margined, rounded and short stipitate at base, more or less nerved, tapering into the smooth bidentate beak ⅓ length of body.

Type Locality: "Mountains from Colorado and Wyoming westward."

Alpine slopes from Washington to California and east to Wyoming and Colorado. In California it extends from Mt. Whitney north in the Sierra Nevada, and also occurs in the northeastern part of the state.

Locs.: Ebbets Pass, *Brewer* 2066; Summit Camp, *Kellogg;* Big Trees, Calaveras Co., *Hillebrand* 2304; Tulare Co., *Hall & Babcock* 5545; Modoc Co., *Manning* 433; Mt. Goddard, *Hall & Chandler* 694; Mt. Silliman, *Dudley* 1491; Mineral King, *Dudley* 1605; Glacier Lake, *Dudley* 1702; Kaweah River, *Dudley* 1396, 3327; Kaweah Peaks, *Dudley* 2134; Kennedy Lake, *A. L. Grant* 539; Stanislaus Peak, *A. L. Grant* 534; Summit Valley, *Pringle* 490; Butte Co., *R. M. Austin* 1159; Mt. Whitney, *Vernon Bailey* 2067.

Refs.: Carex vernacula Bailey, Bull. Torr. Club 20: 417 (1893). "*C. fœtida* All." W. Boott in S. Wats. Bot. Cal. 2: 232 (1880). "*C. incurva* Lightf." Bailey, Contrib. U. S. Nat. Herb. 4: 214 (1893). *C. fœtida* All. var. *β. vernacula*, Kuk. in Engler, Pflzr. 4[20]: 115 (1909).

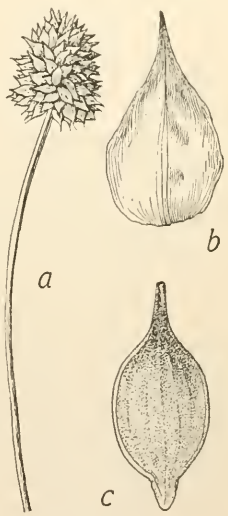

Fig. 4. Carex vernacula Bailey.

a, inflorescence, × 1; *b*, scale, × 8; *c*, perigynium, × 8.

V. Divisæ Christ. Rootstocks long-creeping, dark-colored, tough, the culms arising singly or in small clumps at intervals, mostly stiff, dark-tinged at base, aphyllopodic. Leaf-blades narrow. Spikes few to many, ovoid or oblong, androgynous or dicœcious, more or less closely aggregated into an oblong or oblong-ovoid head. Heads in some species dicœcious or nearly so. Lower one to several bracts developed, short-prolonged, the others bract-like. Perigynia appressed-ascending, plano-convex, smooth, often shining, coriaceous, more or less nerved on outer and nerved or nerveless on inner surface, sharp-edged but not wing-margined, rounded and spongy at base, the obliquely cut beak in age bidentulate. Achenes lenticular, closely enveloped. Style slender, jointed with achene, deciduous. Stigmas 2.

6. C. Douglasii Boott. Rootstocks slender but tough, brownish, the culms 6-30 cm. high, smooth, obtusely triangular, light brownish at base; leaf-blades 1-2.5 mm. wide, flat or channeled at base; heads dicœcious or nearly so; staminate spikes linear-elliptic, 8-15 mm. long, 2.5-4 mm wide, the scales straw-colored or brownish, pointed; pistillate spikes wider, the scales ovate to lanceolate, concealing the perigynia, yellowish-brown, with broad hyaline margins and lighter center; perigynia lanceolate, strongly nerved, 4 mm. long, 1.75 mm. wide, light brownish, lightly nerved ventrally, strongly nerved dorsally, rounded and short stipitate at base, tapering into the strongly serrulate beak nearly 2 mm. long, its apex hyaline, obliquely cut dorsally, in age bidentate; styles elongate.

Type Locality: "N. W. Coast, Douglas."

Dry or alkaline soil from Manitoba to New Mexico westward to California and British Columbia. In California it is found only along or east of the Sierra Nevada, except for occurring locally in the southern mountains.

Locs.: Lake Tahoe, *Geo. B. Grant;* Tuolumne Soda Spgs., *Congdon;* Yosemite, *Bolander* 6199, *Bioletti;* Mono Valley, *Brewer* 1813; Palmers, Mariposa Co., *Congdon;* Donner Lake, *Davy* 3233B; Honey Lake Valley, *Davy* 3289; Echo, El Dorado Co., *Brainerd* 154; Truckee, *Dudley, Hitchcock* 301; Jess Valley to Blue Lake, *Griffiths & Hunter* 459; Mt. Pinos, Ventura Co., *Hall* 6554; Piñon Mts., *Parish;* North Fork Crooked Creek, White Mts., *Jepson* 7271.

Refs.: Carex Douglasii Boott, Hook. Fl. Bor. Am. 2: 213, pl. 214 (1840); W. Boott in S. Wats. Bot. Cal. 2: 231 (1880); Parish, Bull. S. Cal. Acad. 5: 23 (1906); Kük. in Engler, Pflzr. 4[20]: 122 (1909). *C. Nuttallii* Dewey, Am. Jour. Sci. (1) 43: 92, pl. 2. f. 97 (1842), type from Rocky Mountains. *C. Douglasii* Boott var. *densi-spicata* Dewey, Am. Jour. Sci. (2) 32: 41 (1861), type from Jackson's Hole on Snake River. *C. Douglasii* Boott var. *minor* Olney, Bot. King 5: 363 (1871), type from Nebraska. *C. Fendleriana* Boeck. Linnæa 39: 135 (1875), type from New Mexico. *C. Douglasii* Boott var. *laxiflora* Bailey, Mem. Torr. Club 1: 20 (1889), type from Utica, Montana. *C. irrasa* Bailey, Bot. Gaz. 25: 271, (1898), type from Utica, Montana. *C. Meckii* Dewey, Am. Jour. Sci. (2) 24: 48 (1857), type from White River, Nebraska.

7. C. simulata Mackenzie. Rootstocks slender, long-creeping, the culms 3-5 dm. high, roughened on the angles above, much exceeding the leaves; leaf-blades 2-4 mm. wide, flat; head linear-oblong or oblong-ovoid, 12-25 mm. long, 6-10 mm. wide, the 5-15 spikes densely aggregated, pistillate, staminate or androgynous; bracts shorter than head; scales concealing the perigynia, euspidate, brown with hyaline margins; perigynia ascending, broadly ovate, 1.8-2.25 mm. long, 1.5 mm. wide, round-truncate at base and little spongy, not margined, nerveless ventrally, serrulate above, abruptly beaked, the beak 0.25 mm. long, obliquely cut dorsally, at length bidentulate.

Type Locality: Chug Creek, Albany Co., Wyoming (A. Nelson 7316).

Wet soil from Montana to New Mexico westward to California and Washington. In California it is found along or east of the Sierra Nevada from Fresno Co. northward.

Locs.: Sonora Trail, *Brewer* 1865; Echo and Mrs. Watson's, El Dorado Co., *Brainerd;* Rowan Meadow, Fresno Co., *Dudley;* Sierraville, *Dudley;* Soda Spgs., Nevada Co., *M. E. Jones;* Jess Valley to Blue Lake, *Griffiths & Hunter* 425; Modoc Co., *Manning* 952 (in part); Sisson, *Dudley;* Kings River Cañon, *Dudley* 3193.

Refs.: Carex simulata Mackenzie, Bull. Torr. Club 34: 604 (1908). "*C. Gayana* Desv." Boott, Ill. Car. 3: 126, pl. 411 (1862); W. Boott in S. Wats. Bot. Cal. 2: 231 (1880); Kük. in Engler, Pflzr. 4[20]: 122 (1909) in part.

8. C. pansa Bailey. (Fig. 5.) Culms arising singly, 1.5-3 dm. high, triangular, roughened above; leaf-blades 1-3 mm. wide; head 1.5-2.5 cm. long, the spikes lance-ovoid, 7-8 mm. long, 5 mm. wide, the several to many perigynia appressed; scales with conspicuous white hyaline margins, concealing perigynia; perigynia 1.5-2 mm. wide, lanceolate-elliptic, nerveless ventrally, tapering at base and at apex, the beak 1 mm. long, obliquely cut dorsally, serrulate.

Type Locality: Clatsop, Oregon, and Ilwaco, Washington (Henderson).

Drifting sands along the seacoast from Monterey Co., California, north to southwestern Washington.

Locs.: Pacific Grove, *Olsson-Seffer;* Seaside, Monterey Co., *Alice D. Randall* 251; Asilomar, Monterey Co., *Parish* 11475; San Francisco, *Olsson-Seffer;* Eureka, *Davy & Blasdale* 6218, *Tracy* 3258; Lake Earle, Del Norte Co., *Davy;* Crescent City, *Dudley.*

Ref.: Carex pansa Bailey, Bot. Gaz. 13: 82 (1888).

9. C. prægracilis W. Boott. Culms 2-5 dm. high; leaf-blades 1.5-3 mm. wide, flattened or canaliculate; head linear-oblong to oblong-ovoid, 1-5 cm. long, 6-12 mm. wide, the 5-15 spikes densely aggregated, androgynous, with 4-10 perigynia; scales ovate-lanceolate, acute to cuspidate, nearly concealing the perigynia, light-brownish with hyaline margins; perigynia 3-4 mm. long, 1.5 mm. wide, dark-brown at maturity, nerved on the outer, nearly nerveless on the inner face, obliquely cut dorsally.

Type Locality: San Diego, California (Miss Scott).

Meadows, widely distributed and variable, Manitoba, Iowa and Kansas to Yukon, British Columbia, California and central Mexico. Widely distributed in California except on the higher mountains.

The species was founded on slender desiccated specimens, and the original description of the leaf-blades as thread-like and convolute is apparently based on some broken-off culms; some ordinary flattened leaf-blades are however present. The species has also been much confused in California with Carex siccata Dewey. This widely distributed species, of which I have seen no specimens from California, has sharply bidentate perigynia. All California material so named, belongs to C. prægracilis. Flowering specimens of this species present a markedly different aspect from mature fruiting specimens, and even in the latter case specimens in which the perigynia are numerous give a different first impression than those in which the staminate flowers predominate.

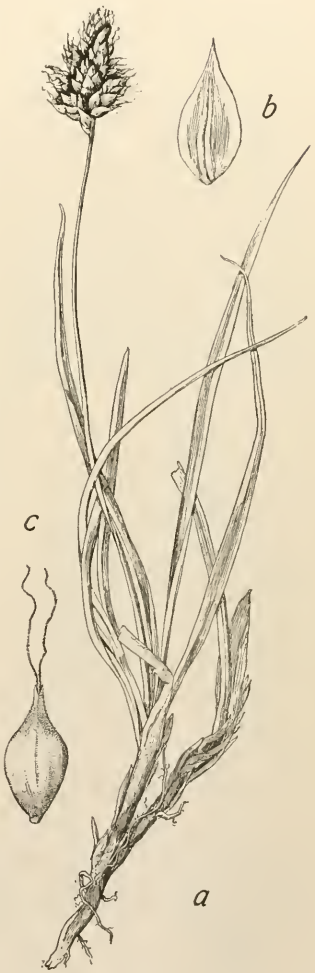

Fig. 5. Carex pansa Bailey.
a, habit, × 2/3; *b*, scale, × 5; *c*, perigynium, × 5.

Locs.: San Jacinto Mts., *Hall* 2664; San Antonio Mts., *Abrams* 2679, *Hall* 1455, *Johnston* 1362; Bear Valley, *Parish* 1611 (in part), *Abrams* 2918; San Bernardino, *Parish* 1058 (in part), 4651; Acton, *Hasse;* Mt. Pinos, *Hall* 6375, 6377 (in part); Santa Ana, Orange Co., *Geis* 502, 503, 504, 505, 506, 567; Los Angeles Co., *Hasse* 4085, 4634, *Abrams* 1227, 201, 1447, 3239, *Geo. B. Grant* 6265; Orcutt, *Orcutt* 2219; Pasadena, *McClatchie* 903; San Diego Co., *Hasse;* Pacific Grove, *Heller* 6634; Sacramento, *Bolander* 4502, 4503; Auburn, *Bolander* 4549, 4550; Purdy, Sierra Co., *Heller & Kennedy* 8668; Tropico, *Abrams* 1439; Santa Clara Valley, *Peckham;* San Buenaventura, *Peckham;* Gazelle, Siskiyou Co., *Heller* 8072; Mill Creek, Mt. Lassen, *Hall & Babcock* 4308 (in part); Fort Tejon, *Davy* 2364; Leonis Valley, *Davy* 2618; Echo, El Dorado Co., *Brainerd;* Hepsedam Peak, San Benito Co., *Dudley;* Mayfield and Palo Alto, Santa Clara Co., *Dudley;* Woodside, San Mateo Co., *Dudley;* Sierra Valley, *Lemmon;* Mt. Pinos, *Dudley & Lamb* 4453; Grant Park, *Dudley* 1223; Homer's Nose, *Dudley* 1853; Oak Knoll, Los Angeles Co., *Braunton* 800; Coffee Creek, *Goldsmith* 17; Silver Lake, *M. E. Jones* 197; San Francisco, *M. E. Jones* 3268; Lone Pine, Inyo Co., *Coville & Funston* 2164; Lower Sacramento, *Wilkes* 1262; White Mts., Mono Co., *Shockley* 632; Owens Valley, *Horn;* Asilomar, Monterey Co., *Parish* 11565; San Pedro, *Wood* 262; Santa Barbara, *Bingham* 491; "California," *Hartweg* 203; Ontario, San Bernardino Co., *Johnston* 1257; Pomona, *Johnston* 1272; Upland, San Bernardino Co., *Johnston* 1436; Hueneme, *Davy* 5d; Tallac, El Dorado Co., *Dudley;* Pasadena, *Grant* 3425; Sycamore Slough, Colusa Co., *R. S. Ferris* 625, 718; Giant Forest, *Dudley* 2987; Panamint Valley, *Parish* 10127; Victorville, Mojave Desert, *Johnston;* Hanaupah Cañon, Panamint Mts., *Jepson* 7097.

Refs.: Carex prægracilis W. Boott, Bot. Gaz. 9: 87 (1884); Parish, Bull. S. Cal. Acad. 5: 48 (1906). *C. marcida* Boott in Hook. Fl. Bor. Am. 2: 212, pl. 213 (1840), type from Columbia River (not J. F. Gmel. 1791); W. Boott in S. Wats. Bot. Cal. 2: 231 (1880); Parish, Bull. S. Cal. Acad. 5: 23 (1906); Kük. in Engler, Pflzr. 4[20]: 123 (1909). *C. Douglasii* Boott var. *brunnea* Olney, Bot. King, 5: 363 (1871), type from California, *Coulter* 805. *C. marcida* Boott var. *debilis* Bailey, Proc. Am. Acad. 22: 136 (1886), type from Harney Valley, Oregon. *C. usta* Bailey, Mem. Torr. Club 1: 20 (1889), based on *C. Douglasii* var *brunnea*. *C. marcida* Boott var. *alterna* Bailey in Macoun, Catal. Canad. pl. 5: 374 (1890), type from Shuswap Lake, British Columbia. *C. alterna* C. B. Clarke, Kew Bull. Misc. Inf. Add. Ser. 8: 69 (1908), based on *C. marcida* var *alterna*. *C. camporum* Mackenzie, Bull. Torr. Club 37: 244 (1910), based on *C. marcida* Boott. "*C. Hookeriana* Dewey," Parish, Bull. S. Cal. Acad. 5: 26 (1906). "*C. siccata* Dewey," Parish, l.c. 50. *C. Gayana* Desv. var. *hyalina* Bailey, Proc. Amer. Acad. 22: 135 (1886), type from Sonora, Mexico, *Thurber* 652. *C. latebrosa* Mackenzie, Bull. Torr. Club 34: 603 (1908), based on *C. Gayana* var. *hyalina*.

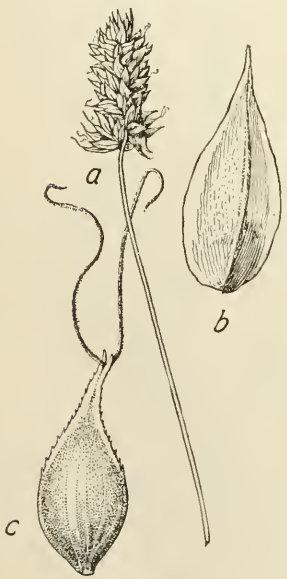

Fig. 6. Carex Hoodii Boott.

a, inflorescence, × 1; *b*, scale, × 7; *c*, perigynium, × 7.

VI. Muhlenbergianæ Tuckerm. Densely cespitose or in a few species the rootstocks elongate, tough and dark-colored. Culms not flattened. Opaque part of leaf-sheaths neither transversely rugulose nor red-dotted. Spikes usually 10 or less, androgynous, or pistillate but never gynæcandrous, rarely at all compound. Bracts from little to strongly developed. Perigynia plano-convex, green or chestnut-tinged or light-brownish in age, from appressed to reflexed, often strongly spongy at base, nerveless or sparingly nerved, narrowly sharp-margined, conspicuously beaked, the beak sharply bidentate. Achenes lenticular. Style jointed with achene, deciduous, its base more or less thickened. Stigmas 2.

10. C. Hoodii Boott. (Fig. 6.) Densely cespitose, the rootstock woody, the culms 3-6 dm. high, slender but rather stiff, rough above, brownish at base; leaf-blades 1.5-3.5 mm. wide, flat, the sheaths thin at mouth, not prolonged beyond base of blade; head orbicular or oblong-ovoid, 1-2 cm. long, 8-15 mm. wide, the spikes several, with 5-10 ascending perigynia; scales ovate, sharp-pointed, chestnut brown with lighter keel and broad hyaline margins; perigynia lance-ovate, 4-5

mm. long, 1.75-2 mm. wide, green and brownish tinged, obsoletely nerved toward the base, green margined above, contracted into a bidentate beak ⅓ length of body.

TYPE LOCALITY: Columbia River (Douglas; Scouler).

Mountain meadows and slopes from Alberta to Colorado, westward to California and British Columbia. In California it is confined to the Sierra Nevada and extends south to Tulare Co.

LOCS.: Yosemite, *Bolander* 6215, 6218, *Abrams* 4398, *Dudley;* head of Tuolumne, *Brewer* 1772; Tallac and Meisners, El Dorado Co., *Brainerd;* Morgan, Tehama Co., *Hall & Babcock* 4346; Mill Creek, Mt. Lassen, *Hall & Babcock* 4308 (in part); Minarets, *Congdon;* Tuolumne Soda Spgs., *Congdon;* Soda Spgs., Tulare Co., *Dudley* 2343; Tuolumne Soda Spgs., *Brewer* 1702; Emigrant Gap, *M. E. Jones* 3532; Pea Ridge Road, Mariposa Co., *Congdon;* Hat Creek, Shasta Co., *Eggleston* 7416; "California," *Kellogg & Harford* 1069; Kennedys Lake, *A. L. Grant* 199; Lake Merced, Yosemite Park, *Jepson* 4409, 4428.

REFS.: CAREX HOODII Boott, Hook. Fl. Bor. Am. 2: 211, pl. 211 (1840); W. Boott in S. Wats. Bot. Cal. 2: 231 (1880); Kük. in Engler, Pflzr. 4[20]: 154 (1909). *C. muricata* L. var. *confixa* Bailey, Bot. Gaz. 10: 203 (1885), type from Wyoming, *Parry* 281. *C. Hoodii* Boott var. *nervosa* Bailey, Mem. Torr. Club 1: 14 (1889), type *Kellogg & Harford* 1069 from "California."

11. C. tumulicola Mackenzie. (FIG. 7). Short creeping from tough rootstocks; culms 4.5-8 dm. high, rough above; leaf-blades 1.5-2.5 mm. wide; head 2-5 cm. long, slender and often rather flexuous, the spikes 5-10, the upper aggregated, the lower separate, with 10 or fewer appressed ascending perigynia; bracts, especially the lower, long-cuspidate; scales largely concealing perigynia, brownish straw-color with hyaline margin and green midrib, acuminate to cuspidate; perigynia brownish, lanceolate, 4-5 mm. long, 1.5 mm wide, prominently narrow margined, nerved on both surfaces or nerveless on the inner surface, round-tapering and substipitate at base, contracted into a serrulate bidentate beak ⅓ to ½ length of body.

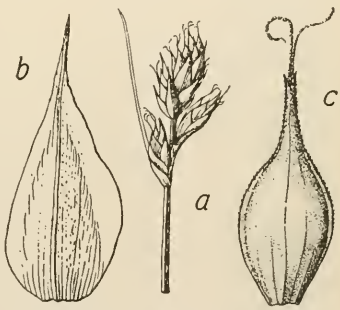

FIG. 7. CAREX TUMULICOLA Mackenzie. *a*, inflorescence, × 1; *b*, scale, × 8; *c*, perigynium, × 8.

TYPE LOCALITY: Lake Temescal, Alameda Co., California (Bioletti).

Dry soil from Washington and Oregon south in the coastal counties of California to Monterey Co., and in the Sierra Nevada to Tuolumne Co.

LOCS.: Oakland Hills, *Bolander* 21, 2300; San Francisco, *Bolander* 6195, *Brewer* 1568 (in part); Lake Temescal, Alameda Co., *Bioletti;* Los Gatos, Santa Clara Co., *Heller* 7309; Stanford University, *Elmer* 2357; Laribee Creek, Humboldt Co., *Tracy* 4712; Mark West Creek, Sonoma Co., *Bolander* 3819, 3821; Angel Isl., San Francisco Bay, *Bolander* 1568, 1569; Santa Cruz Mts., *Bolander* 150, *Hitchcock* 170; Pt. Isabel, Contra Costa Co., *Davy;* Monterey, *Davy* 7268; Berkeley Hills, *Davy* 4244; Klamath River, Humboldt Co., *Chandler* 1416; Santa Rosa, *Heller* 5324, *Congdon;* Fort Bragg, *Bolander* 4765; "California," *Bigelow;* Eureka, *Tracy* 4642; Kneeland Prairie, Humboldt Co., *Tracy* 3835; Humboldt Hill, Humboldt Co., *Tracy* 2507; Hydesville, *Tracy & Babcock* 3591; Dinsmore's Ranch, Humboldt Co., *Tracy* 4104; Permanente Ravine, Hidden Villa and Stanford University, Santa Clara Co., *Dudley;* Coal Mine Ridge, El Corte Madera, Crystal Spgs. and San Mateo, San Mateo Co., *Dudley;* St. Helena, *Jepson* 6242; mountain above Relief Dam, Tuolumne Co., *A. L. Grant* 370; Calaveras Big Trees, *A. L. Grant* 4c.

REFS.: CAREX TUMULICOLA Mackenzie, Bull. Torr. Club 34: 154 (1907). *Carex muricata* L. var. *gracilis* Boott," W. Boott in S. Wats. Bot. Cal. 2: 232 (1880). "*Carex Hookeriana* Dewey," Kük., in Engler, Pflzr. 4[20]: 161 (1909), as to California plant.

VII. MULTIFLORÆ Kunth. Densely cespitose. Culms sharply triangular. Opaque part of sheaths usually transversely rugulose, red-dotted. Spikes numerous, small, androgynous or pistillate, but never gynæcandrous, the lower more or less compound. Bracts frequently conspicuous. Perigynia plano-convex, yellowish or yellowish-brown, appressed-ascending or spreading, not thick-walled, somewhat spongy at base, short-stipitate, sharp-margined, more or less nerved, conspicuously rough-beaked, the beak bidentate. Achenes lenticular. Style more or less enlarged at base, jointed to achene. Stigmas 2.

12. C. stenoptera Mackenzie n. sp. Rootstocks short-creeping; culms 2.5-4 dm. high; leaf-blades 2-3 mm. wide, channeled, the sheaths tight, not cross-rugulose, obscurely red-dotted; head decompound, 2.5-5 cm. long, 6-10 mm. wide, with numerous spikes 5 mm. long, 4-6 mm. wide; bracts inconspicuous; scales ovate-lanceolate obtusish to short-cuspidate, brownish with conspicuous hyaline margins, exceeding perigynia; perigynia lanceolate-ovate, narrowly thin-winged to base, stramineous, membranaceous, plano-convex, 3-3.5 mm. long, 1.5 mm. wide, nerved dorsally, nerveless ventrally or nearly so, round-tapering at base, tapering into a serrulate bidentate beak about half length of the body.

TYPE LOCALITY: Ice House Cañon, San Antonio Mts. (Johnston) 1505.

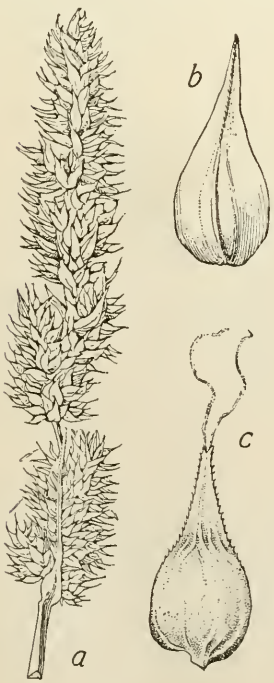

FIG. 8. CAREX ALMA Bailey.
a, inflorescence, × 1; *b*, scale, × 8; *c*, perigynium, × 8.

13. C. alma Bailey. (FIG. 8). Culms 3-12 dm. high, strict, sharply triangular, rough on angles; leaves with blades 3-6 mm. wide, the sheaths very thin at mouth, exceeding the base of the blade; head 2.5-10 cm. long, decompound, the clusters from closely aggregated to strongly separate, the individual spikes hardly recognizable, the perigynia few, spreading; lower few bracts short, with broad dilated hyaline-margined base; scales ovate, short pointed to obtusish, straw-colored or brownish; perigynia 3.5 mm. long, 1.8 mm. wide, plano-convex, smooth, shining, broadly ovate from a rounded base, narrowly green-margined, serrulate from middle, lightly few nerved on both sides, tapering into the serrulate bidentate beak ½ length of body.

TYPE LOCALITY: San Bernardino Co., California (Parry & Lemmon 396).

Along streams in southern California from Monterey and Tulare Counties southward, and eastward to southern Nevada; reported from Arizona.

LOCS.: San Bernardino Co., *Parry & Lemmon* 396; Mill Creek Mts., *Parish* 1058 (in part), *Robertson;* Agua Caliente, *Parish* 1572; San Bernardino Mts., *Parish* 3724, 1611 (in part), 2223, *Hasse;* Whitewater Basin, San Bernardino Co., *C. M. Wilder;* Palm Spgs., *Parish* 4144; Mt. San Gorgonio, *Geo. B. Grant* 6399; Pasadena, *McClatchie, Geo. B. Grant* 138*a*, 6305; Acton, *Hasse;* Mt. Pinos, Ventura Co., *Hall* 6429, 6570; Topatopa Mts., Ventura Co., *Abrams & McGregor* 119; Griffins, Ventura Co., *Elmer* 3949; Tassajara Hot Spgs., Monterey Co., *Dudley, Elmer* 3137; San Antonio Mts., *Abrams* 2769; Mt. Wilson, *Geo. B. Grant* 6692 (in part); Mt. Pinos, Kern Co., *Dudley & Lamb* 4631, *Hall* 6377 (in part); Nelsons Fork, Tulare Co., *Dudley* 2663; Kern River, *Dudley* 817; Nelsons Soda Spgs., Tulare Co., *Dudley* 877; Bisses Station, Kern Co., *Dudley* 405; Altadena, *McClatchie;* San Antonio Cañon, *Johnston* 1411; San Antonio Mts., *Johnston* 1425; El Monte, Los Angeles Co., *Johnston* 27*e*; Upper San Antonio Cañon, *Johnston* 1508; New York Mts., San Bernardino Co., *Parish* 10225.

Refs.: Carex alma Bailey, Mem. Torr. Club 1: 50 (1889); Parish, Bull. S. Cal. Acad. 5: 22 (1906); Kük. in Engler, Pflzr. 4[20]: 146 (1909). *C. vitrea* Holm., Am. Jour. Sci. (4) 17: 302-3, f. 5-7 (1904), type from Palm Spgs., Cal., *Parish* 4144; Parish, l. c. "*C. chrysoleuca* Holm," Parish, l. c.

14. C. densa Bailey. (Fig. 9). Culms 3-6 dm. high, sharply triangular, stiff, smooth or roughened immediately beneath head, from exceeding to shorter than the leaves; leaf-blades 3-6 mm. wide, the sheaths loose, conspicuously septate dorsally, and thin, hyaline and more or less cross-rugulose ventrally, prolonged and convex at the mouth; head 2-5 cm. long, 1.5 cm. wide, dense, decompound, the clusters closely aggregated, the individual spikes hardly recognizable, the perigynia few, appressed-ascending; bracts inconspicuous, except 1 or 2 lower ones; scales ovate, dark chestnut brown with green midvein, acute to cuspidate, shorter than perigynia; perigynia 4-4.5 mm. long, 1.5 to 1.75 mm. wide, strongly convex dorsally, slightly convex ventrally, ovate or ovate-lanceolate from a round-tapering, substipitate base, straw-colored or at length brownish, strongly several nerved on both faces, narrowly green margined, the upper half of body serrulate, more or less abruptly beaked, the beak more than ½ length of body.

Type Locality: Mark Wests Creek and Napa, California (Bigelow).

Dry soil west of the higher ranges of the Sierra Nevada from Santa Clara and Mariposa counties northward into Oregon.

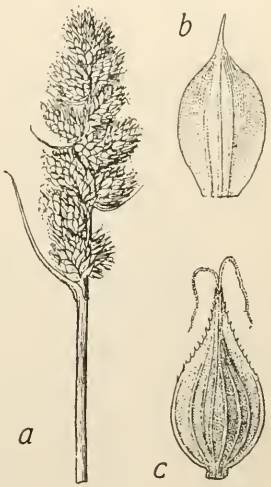

Fig. 9. Carex densa Bailey. *a*, inflorescence, × 1; *b*, scale, ×6; *c*, perigynium, × 6.

Locs.: "California," *Bigelow, Kellogg & Harford* 1066, 1067; Crystal Springs, San Mateo Co., *Abrams* 2444, *Elmer* 4428; Pine Grove, Amador Co., *Hansen* 1233; Mariposa Co., *Congdon;* Mark Wests Creek, *Bigelow;* Snow Creek, Mariposa Co., *Congdon;* Oakland, *Congdon;* Witch Creek, *Alderson* 362; Darrah and Mormon Bar, Mariposa Co., *Congdon;* Yreka, Siskiyou Co., *Butler* 809; Cloverdale, Sonoma Co., *Bolander* 3824; Los Guilicos Valley, Sonoma Co., *Bioletti;* Healdsburg, *A. King;* Calistoga, *Tracy* 1637; Cahill Ridge, Seal Cove, Crystal Spgs., Coal Mine Ridge, San Andreas Reservoir, Summit Spgs., San Mateo Co., *Dudley;* Arnolds Run and Madrone, Santa Clara Co., *Dudley;* Oakland, *Bolander* 6204; Trinity Co., *Blankinship;* Glorietta, *Davy* 7843, 7844; Sherwood Valley, Mendocino Co., *Davy* 5150; "California," *Vasey;* San Francisco, *Brewer* 1568 (in part); San Rafael, *Blankinship;* Sherwood Valley, Mendocino Co., *Dudley;* Weaverville, Trinity Co., *Yates* 296; Buck Mt., Humboldt Co., *Tracy* 4231; Susanville, *M. E. Jones;* Santa Rosa, *Wooton;* Belmont, Santa Clara Co., *Elmer* 2312; Santa Cruz Mts., *J. R. Bush;* Dunlap, *Griffiths* 4705; North Fork, *Griffiths* 4479; Russian River, *Bolander* 3871; Anderson Valley, *Bolander* 4808; Tamalpais, *Bioletti* 23; Kenwood, Sonoma Co., *Bioletti* 17; San Gregorio Creek, San Mateo Co., *Kellogg & Brannan;* Sisson, *Jepson* 51*a*; Marysville Buttes, *R. S. Ferris* 640.

Refs.: Carex densa Bailey, Mem. Torr. Club 1:50 (1889); Parish, Bull. S. Cal. Acad. 5: 26 (1906); Kük. in Engler, Pflzr. 4[20]: 167 (1909) in part. "*C. Brongniartii* Künth." Boott, Ill. Car. 3: 124 (in part), pl. 402 (1862). *C. Brongniartii* Kunth. var. *densa* Bailey, Proc. Am. Acad. 22: 137 (1886). *C. vicaria* var. *costata* Bailey, Mem. Torr. Club 1: 49 (1889), type from Grants Pass, Oregon. *C. chrysoleuca* Holm, Am. Jour. Sci. (4) 17: 302 (1904), type from Mariposa, California. "*C. disticha* Hudson," W. Boott in S. Wats. Bot. Cal. 2: 230 (1880). "*C. glomerata* Thunb." W. Boott, l. c. 232. "*C. paniculata* L.," W. Boott, l. c. 232, in part.

Carex densa is based on *Carex Brongniartii* var. *densa* Bailey. This variety was based on citations of *Carex xalapensis* Kunth, *C. Hoodii* Boott "as to Californian specimens," *C. Brongniartii* Kunth as figured by Boott Ill. Car. pl. 402 and "*C. paniculata* L." W. Boott in Bot. Cal. 2: 232, and specimens were cited "California, *Palmer* 389 (San Diego Co.) *Bigelow, Brewer* and others." In raising the variety to specific rank, the first two citations were eliminated, and specimens were cited "California; *Palmer, Bigelow, Brewer, Kellogg & Harford* 1067." The reference to the *C. paniculata*

of W. Boott arose from two plants being distributed under *Bolander* 1568, as explained under *Carex Cusickii*, and is really intended to refer to part of Bolander's collection rather than to W. Boott's description. Boott's pl. 402 is from the Bigelow collection, and it, part of *Bolander* 1568 and the Brewer and Kellogg & Harford material, represent the same plant. *Palmer* 389 as represented at the Gray Herbarium is *Carex subfusca* W. Boott, although it is cited by W. Boott in Bot. Cal. 2: 232 as "*C. fatida* All." (*C. vernacula* Bailey). It is to be noted in this connection that *Palmer* 389 is the first number cited by Bailey under *Carex festiva* var. *stricta* Bailey, Mem. Torr. Club 1: 51. Under the circumstances I take Bigelow's specimens as the type of the species.

15. C. vicaria Bailey. Culms 3-6 dm. high, sharply triangular (exceeding the leaves), strongly roughened on angles above; leaves with blades 3-4.5 mm. wide, the sheaths tight, not conspicuously septate dorsally, thin hyaline and more or less cross-rugulose ventrally, short-prolonged and convex at mouth; head 1.5-3 cm. long, about 12 mm. wide, decompound, the clusters closely aggregated, or the lower slightly separate, the individual spikes hardly recognizable, the perigynia in each few, spreading at maturity; bracts inconspicuous except 1 or 2 lower ones; scales ovate, acute to cuspidate, shorter than perigynia, reddish-brown tinged with green midvein; perigynia 3-3.5 mm. long, 1.5 mm. wide, plano-convex, smooth, ovate from a rounded base, substipitate, reddish tinged with green margin, few nerved dorsally, nerveless ventrally, the body sparingly serrulate above, contracted into the serrulate bidentate beak ½ length of body.

Type Locality: Oregon (E. Hall).

Marshes and swales, Washington to northern California.

Locs.: Round Valley, Mendocino Co., *Chestnut* 108, 285; "California," *Kellogg & Harford* 1068.

Refs. Carex vicaria Bailey, Mem. Torr. Club 1: 49 (1889). "*C. Brongniartii* Kunth." Bailey, Proc. Am. Acad. 22: 137 (1886). *C. vulpinoidea* Michx. var. *vicaria* Kük., in Engler, Pflzr. 4[20]: 148 (1909).

Carex vicaria Bailey is based on "*Carex glomerata*" Boeckl. in part, Linnæa 39: 59 and W. Boott in Bot. Cal. 2: 232 (1880), and on "*C. Brongniartii*" Bailey, and the range is given "Oregon and California," but no specimens are cited. Under Bailey's description of *Carex Brongniartii*, reference is made to *C. hypoxanthus* Steud. and "*C. glomerata* authors not Thunb." and specimens are cited: "Arizona; California, *Kellogg & Harford* 1068; wet meadows, Mendocino City, *Bolander* 4808; Oakland Slough, *Bolander* 6204; Oregon, *Hall;* Chili." Disregarding *C. hypoxanthus* Steud. and the Arizona and Chili plants, as having been eliminated by Prof. Bailey, I am taking the Oregon plant collected by Hall as the type of Carex vicaria. It is indirectly the first specimen cited and best answers the rather general description given. The California specimens cited, except *Kellogg & Harford* 1068, seem to me better referable to Carex densa Bailey.

16. C. Dudleyi Mackenzie n. sp. Culms 3-6 dm. high, roughened on the angles and sharply triangular beneath the head, exceeding leaves; leaves with blades 4-7 mm. wide, flat, little roughened above, the sheaths tight, inconspicuously septate dorsally, white hyaline and scarcely if at all cross-rugulose ventrally, short-prolonged and convex at mouth; head 2-3.5 cm. long, 9-12 mm. wide, decompound, the spikes all very closely aggregated and hardly recognizable, the perigynia in each few, spreading at maturity; bracts setaceous, at least the lower conspicuous; scales ovate-lanceolate, mostly shorter than perigynia, yellowish-green, strongly cuspidate or awned; perigynia 2.5-3 mm. long, 1.25-1.5 mm. wide, plano-convex, smooth, narrowly ovate from a rounded base, substipitate, brownish-yellow with green margin, few nerved dorsally, obscurely nerved ventrally, the body not serrulate, contracted into the serrulate bidentulate beak of its own length.

Type Locality: Tassajara Hot Spgs., Monterey Co., California (Elmer 2132).

Coast Ranges from Monterey Co. to Lake Co. Apparently local.

Locs.: Moore Creek, Napa Co., *Tracy* 1523; Tassajara Hot Spgs., Monterey Co., *Elmer* 3132; Glen Ellen, Sonoma Co., *Bioletti* 19; Scott Valley, Lake Co., *Blankinship*.

Named for the late Prof. W. R. Dudley, who had left notes with the type specimen in the herbarium of Stanford University, showing that he recognized this as an undescribed species. Prof. Dudley's large collections of Carex in California have very materially extended our knowledge of the genus, and it is highly fitting that his labors and studies should be remembered.

VIII. Paniculatæ Kunth. Densely or loosely cespitose. Culms not flattened. Opaque part of leaf-sheaths strongly red-dotted. Spikes numerous, small, androgynous or pistillate, but never gynæcandrous, the lower compound or decompound. Bracts usually inconspicuous. Perigynia thick, high convex on the dorsal and often somewhat convex on the ventral face, brownish or chestnut in age, ascending or spreading, coriaceous, spongy at base, stipitate, narrowly margined, more or less nerved, conspicuously rough-beaked, the beak bidentate. Achenes lenticular. Style jointed with achene, deciduous, its base more or less thickened. Stigmas 2.

17. C. diandra Schrank. Loosely cespitose, the culms 3-7 dm. high, slender, sharply triangular, the sides convex; leaf-blades 1.25 mm. wide, canaliculate at base; sheaths not copper-colored at the mouth; head 2.5-5 cm. long, somewhat compound, the lower spikes more or less separated; scales nearly equaling perigynia, acute, brownish with lighter midvein and hyaline margins; perigynia strongly convex dorsally, low convex ventrally, dark chestnut, sharp edged but not margined, shining, smooth, hard, nerveless on inner face except at base, nerved on outer face, round-truncate and stipitate at base, contracted into a flat bidentate beak nearly length of body, spreading at maturity.

Type Locality: Southern Bavaria, Germany.

Wet meadows from Newfoundland to New Jersey westward to Yukon, Colorado and British Columbia, and very local in Tulare and San Bernardino Cos., California; widely distributed in Eurasia and recorded from New Zealand.

Locs.: Herkebraths Meadow, San Bernardino Valley, *Parish* 4600, April 13, 1900; Oriole Lake, Tulare Co., *Dudley*.

Refs.: Carex diandra Schrank, Acta Acad. Mogunt. 49 (1782); Kük., in Engler, Pflzr. 4[20]: 175, f. 28, A-D (1909). *C. teretiuscula* Good. Trans. Linn. Soc. 2: 163, pl. 19, f. 3 (1794), type from Norwich, England. *C. Bernardina* Parish, Bull. S. Cal. Acad. 5: 24, pl. 21 (1906), type from San Bernardino Valley, Cal., *Parish* 4600.

18. C. Cusickii Mackenzie. (Fig. 10). More densely cespitose than *C. diandra*, the culms sharply triangular, stout, 7-12 dm. high, rough above, much exceeding the leaves; leaf-blades 2.5-6 mm. wide, flat with slightly revolute margins, the sheaths strongly red-dotted; head 4-8 cm. long, 1-2 cm. wide, decompound, the lower branches separated, the spikes ovoid, 3-6 mm. long, 2.5-4 mm. wide; scales chestnut-tinged with lighter midvein and hyaline margins; perigynia 3-4 mm. long, 1.5 to 1.75 mm. wide, dark brownish black, very thick-nerved dorsally, lightly nerved at base ventrally, strongly convex dorsally, slightly convex ventrally, spreading in age, truncate and short stipitate at base, abruptly beaked, the beak setulose-serrulate, shallowly bidentate, about length of body of perigynium.

Type Locality: Head of Burnt River, east Oregon (Cusick 1331).

Fig. 10. Carex Cusickii Mackenzie.

a, inflorescence, × 1; *b*, scale, × 8; *c*, perigynium, × 8.

Wet meadows, British Columbia to California, eastward to Montana. In California it is found only in the Coast Ranges from San Francisco northward where it is apparently rare.

Locs.: San Francisco, *Bolander* 1568 (in part); Crescent City, Del Norte Co., *Dudley*.

Refs.: Carex Cusickii Mackenzie in Piper & Beattie, Fl. of the Northwest Coast 72 (1915). *C. teretiuscula* Good. var. *ampla* Bailey, Mem. Torr. Club 1: 53 (1889), type from Burnt River, east Oregon, *Cusick* 1331. "*C. paniculata* L." W. Boott in S. Wats. Bot. Cal. 2: 232 (1880) in part. "*C. diandra* Schrank var. *ampla* Bailey," Kük., in Engler, Pflzr. 4[20]: 177 (1909).

Two separate collections were distributed under *Bolander* 1568. The present plant was sent to F. Boott and by him named *C. paniculata* L., which it much resembles. Other specimens distributed under the same number are very mature *C. densa* Bailey, and in view of F. Boott's determination were a source of much trouble to Olney and W. Boott.

IX. Stenorhynchæ Holm. Densely cespitose or with more or less elongated rootstocks. Culms triangular or somewhat flattened. Opaque part of leaf-sheaths usually transversely rugulose or red-dotted. Spikes few to many, androgynous or pistillate, but never gynæcandrous, the lower from simple to compound. Bracts little developed. Perigynia plano-convex, yellowish or yellowish-brown, appressed-ascending to spreading, not thick-walled but strongly spongy at base, stipitate, strongly many-nerved, the margins nearly obsolete on the lower half, conspicuously beaked, the beak bidentate. Achenes lenticular. Style jointed with achene, deciduous, its base more or less thickened. Stigmas 2.

19. C. Jonesii Bailey. (Fig. 11). Cespitose from somewhat elongated woody rootstocks, the culms 2 dm. high, slender, rough above, exceeding the leaves; leaves clustered near base, the blades 1-2 mm. wide; opaque part of sheath white, not cross-rugulose, truncate at mouth; spikes in a dense ovoid head, 8-12 mm. long, 8-10 mm. wide, the larger with about 5-10 ascending perigynia, the staminate flowers often conspicuous; scales exceeding or shorter than the perigynia, ovate, dark brown with inconspicuous midvein, and hyaline margins; perigynia ovate-lanceolate, 3-4 mm. long, 1.5-1.75 mm. wide, rounded, short-stipitate and spongy at base, strongly many-nerved dorsally, and strongly many-nerved ventrally at maturity, slightly margined above, tapering into a very slightly serrulate bidentate beak ⅓ length of body.

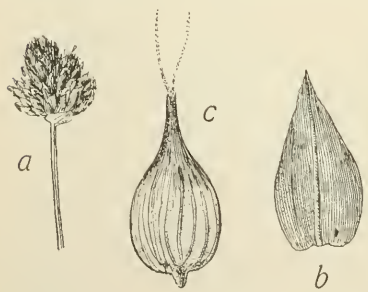

Fig. 11. Carex Jonesii Bailey.

a, inflorescence, × 1; *b*, scale, × 7; *c*, perigynium, × 7.

Type Locality: Soda Spgs., Nevada Co., California (M. E. Jones).

High mountains from Montana to Wyoming, westward to Washington and California, where known from the San Bernardino Mts. and the Sierra Nevada from Tulare to Siskiyou Cos.

Locs.: Yuba Pass, Sierra Co., *Hall & Babcock* 4519; Truckee River, Nevada Co., *Davy;* Tulare Co., *Hall & Babcock* 5167, 5250, 5447; Bluff Lake, San Bernardino Mts., *Parish* 3273; Kaweah Meadow, *Dudley* 2207; Grant National Park, *Dudley* 1860; Homer's Nose, *Dudley* 1852; Cone Peak, *Dudley;* Chagoopa Creek, *Dudley* 2270, 2279, 2280; Sonora Peak, *A. L. Grant* 412; Mt. Shasta, *Goldsmith* 37; Strawberry Creek, El Dorado Co., *Brainerd* 137; North Fork, *Griffiths* 4562, 4569, 4602; Donner Pass, *Torrey* 550; Lassen Forest, Tehama Co., *Eggleston* 7301; Inspiration Rock, Yosemite, *Bolander* 4903; Kings River Cañon, *Dudley* 3191; Peregoy Meadow, Yosemite Park, *Jepson* 4335.

Refs.: Carex Jonesii Bailey, Mem. Torr. Club 1: 16 (1889). *C. nervina* Bailey var. *Jonesii* Kük., in Engler, Pflzr. 4[20]: 167 (1909). "*C. illota* Bailey" Parish, Bull. S. Cal. Acad. 5: 52 (1906). "*C. Bonplandii* Kunth. var. *angustifolia* Boott," W. Boott in S. Wats. Bot. Cal. 2: 233 (1880) as to specimens with androgynous spikes.

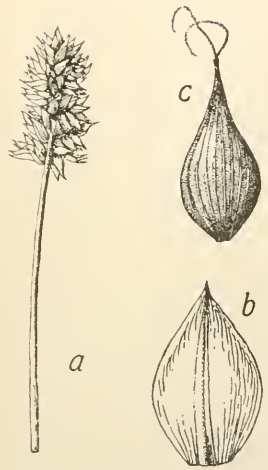

FIG. 12. CAREX NERVINA Bailey.
a, inflorescence, × 1; *b*, scale, × 6; *c*, perigynium, × 6.

20. C. nervina Bailey. (FIG. 12). Cespitose from somewhat elongated stout rootstocks, the culms 5-6 dm. high, strongly aphyllopodic, thick, little roughened above, about equaling the leaves; well developed leaves on the lower fourth of stem, 3.5-5 mm. wide; opaque part of sheaths olive-tinged, becoming cross-rugulose, rounded at the mouth; spikes in a dense ovoid or oblong head, 15-24 mm. long, about 1 cm. wide, the larger with about 6-12 ascending perigynia, the staminate flowers rarely conspicuous; scales ovate, brownish with green center and hyaline margins; perigynia ovate-lanceolate, 4 mm. long, 1.5-1.75 mm. wide, rounded, short-stipitate and spongy at base, strongly many nerved on both faces, sharp-angled above, tapering into a smooth bidentate beak 1 mm. long, the teeth erect.

TYPE LOCALITY: Summit Camp, California (Kellogg).

High mountains from Wyoming to Washington and California, where known from the mountains of Siskiyou Co. and south in the Sierra Nevada to Tulare Co.

Locs.: Summit Camp, *Kellogg;* Emigrant Gap, *M. E. Jones* 3533; Upper San Joaquin, Madera Co., *Congdon;* Alta Meadows, *Geo. B. Grant;* Lake Tenaya, *Congdon;* above Yosemite, *Congdon;* Yosemite, *Hall & Babcock* 3456; Brian's Meadow and Strawberry Creek, El Dorado Co., *Brainerd;* Kaweah River, *Dudley* 1414; Cone Peak, *Dudley;* Mineral King, *Coville & Funston* 1428; Craggy Peak, Siskiyou Co., *Dudley;* Giant Forest, *Dudley* 2998.

REFS.: CAREX NERVINA Bailey, Bot. Gaz. 10: 203, pl. 3, f. 6-8 (1885), not Parish, Bull. S. Cal. Acad. 5: 26 (1906); Kük., in Engler, Pflzr. 4^{20}: 167 (1909).

21. C. stipata Muhl. (FIG. 13). Cespitose, the rootstocks short, stout, the culms 3-10 dm. high, rather weak, sharply triangular, strongly serrulate above, mostly exceeding leaves; leaf-blades 4-8 mm. wide, flat, flaccid, the sheaths strongly septate dorsally, the opaque part thin, quickly broken, cross-rugulose, prolonged above base of blade; head 3-10 cm. long, yellowish-brown, the lower spikes often separate; scales ovate-triangular, light-brownish, with light midvein and hyaline margins, about length of body of perigynium; perigynia lanceolate, strongly nerved, yellowish green or at length brownish, 4-5 mm. long, 1.5 mm. wide, round-cordate, spongy and stipitate at base, strongly nerved dorsally, less strongly ventrally, narrowly margined ventrally, tapering into a serrulate bidentate beak longer than or nearly equaling the body.

TYPE LOCALITY: Pennsylvania, probably near Lancaster (Muhlenberg).

Swamps and wet meadows from Newfoundland to Florida, west to Utah, British Columbia, and northern California as far south as Sonoma and Sierra Cos.

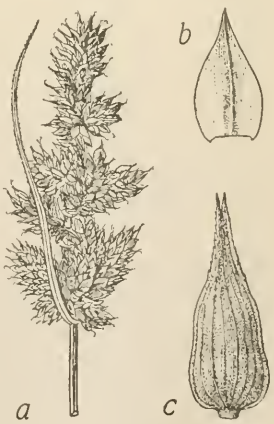

FIG. 13. CAREX STIPATA Muhl.
a, inflorescence, × 1; *b*, scale, × 6; *c*, perigynium, × 6.

Locs.: Weaverville, Trinity Co., *Yates* 295; Rush Creek, Trinity Co., *Yates* 432; Sierra Valley, Sierra Co., *Lemmon* 479; Sisson, *Dudley, Jepson* 56a, *Goldsmith* 12; Oro Fino, *Butler* 805; American Valley, *R. M. Austin* 1066; Santa Rosa, Sonoma Co., *Heller;* Quincy, *Jepson* 4148.

Refs.: Carex stipata Muhl. Willd. Sp. Pl. 4: 233 (1805); Kük., in Engler, Pflzr. 4[20]: 172 (1909).

X. Stellulatæ Kunth. Densely cespitose. Culms triangular. Sheaths not red-dotted or cross-rugulose. Spikes 2 to 10, or by reduction 1, gynæcandrous, pistillate or in a few species staminate, not compound. Bracts inconspicuous. Perigynia plano-convex, yellow-brown or brown, spreading or reflexed at maturity, 2.5-4.5 mm. long, the body orbicular, ovate or broadly oval, strongly spongy at base, sharp-edged nearly if not entirely to the rounded or truncate base, not puncticulate, nerved on the outer, nerved or nerveless on the inner surface, the beak bidentate or obliquely cut. Achenes lenticular. Style slender, jointed with achene, deciduous. Stigmas 2.

22. C. læviculmis Meinsh. (Fig. 14). Cespitose from slender shortly elongate rootstocks, the culms 3-7 dm. high, weak, light brownish at base, roughened above; leaf-blades 1.5-2 mm. wide, light green, flat, soft; spikes 3-8, widely separate or upper approximate, suborbicular, 3-10 mm. long, 3-6 mm. wide, with 3-10 appressed or at length spreading perigynia, the beaks spreading; uppermost spikes long clavate at base; lowest bract more or less developed; scales ovate, hyaline, with conspicuous green midvein, about length of body of perigynium; perigynia green or brownish-green, oblong-ovoid, plano- or concave-convex, 2.5-4 mm. long, 1.5 mm. wide, thin-walled, few-nerved dorsally, lightly nerved ventrally, rounded and substipitate at base, tapering into a sparingly subserrulate beak ¼-⅓ length of body, the apex obliquely cut dorsally, entire or bidentulate.

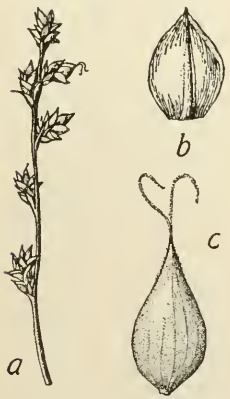

Fig. 14. Carex læviculmis Meinsh.

a, inflorescence, × 1; *b*, scale, × 6; *c*, perigynium, ×6.

Type Locality: "Kamtschatka, Insel Sitcha."

Wet shaded places, Alaska to California and eastward to Idaho; also in eastern Siberia. In California it is found in the mountains of northern California and south in the Sierra Nevada to El Dorado Co.

Locs.: Strawberry Creek, El Dorado Co., *Brainerd* 170; Slippery Ford, El Dorado Co., *Brainerd* 168; Stirling, Butte Co., *Heller* 10819; Bald Mt., Humboldt Co., *Tracy* 4524.

Refs.: Carex læviculmis Meinsh. Bot. Centralb. 55: 195 (1893); Kuk., in Engler, Pflzr. 4[20]: 232 (1909). *C. Bolanderi* Olney var. *sparsiflora* Olney, Proc. Am. Acad. 8: 407 (1872), type from Oregon, *Hall* 580. *C. Deweyana* Schw. var. *sparsiflora* Bailey, Bot. Gaz. 13: 87 (1888).

23. C. interior Bailey. Densely cespitose, the culms 2-3.5 dm. high, slender and wiry, somewhat roughened beneath head; leaf-blades 1-2 mm. wide, flat or somewhat canaliculate; head 1-2 cm. long, the 3-4 spikes approximate, the lateral pistillate, suborbicular, 4 mm. long, with 3-10 widely spreading perigynia, the upper long-tapering and staminate at base; bracts little developed; scales ½ length of the perigynia, ovate-orbicular, very obtuse, brownish, hyaline-margined all around, the center lighter-colored, the midvein not sharply defined and not reaching the tip; perigynia ovoid, straw-color or light-brownish, plump, 2.5 mm. long, 1.5 mm. wide, rounded and spongy at base, very narrowly sharp-margined, nerved dorsally, nerveless or obscurely nerved at base ventrally, sparingly serrulate on the upper margins, abruptly beaked, the beak ⅓ length of body or less, its teeth very short, the ventral suture inconspicuous, the dorsal better developed.

TYPE LOCALITY: Penn Yan, New York (Sartwell).

Boggy meadows from Maine to Florida westward to British Columbia and south to Arizona, northern Mexico and California. In California known only from the northern counties.

Locs.: Mt. Shasta, *A. Wood* 999; Prattville, Plumas Co., *Jones;* Sisson, *Heller* 8041.

REFS.: CAREX INTERIOR Bailey, Bull. Torr. Club 20: 426 (1893). *C. scirpoides* Schk. in Willd. Sp. Pl. 4: 237 (1805) in small part; not *C. scirpoidea* Michx. Fl. 2: 171 (1803), type from Pennsylvania. "*C. stellulata*" Good. Torr. Ann. Lyc. N. Y. 3: 392 (1836), based on the last. *C. stellulata* Good. var. *scirpina* Tuckerm. Enum. Method. 9 (1843), based on *C. scirpoides*. *C. stellulata* Good. var. *scirpoides* Carey in A. Gray Man. 544 (1848); Kük., in Engler, Pflzr 4^{20}: 231 (1909).

24. C. ormantha Mackenzie n. comb. Densely cespitose from short creeping slender rootstocks, the culms 1.5-4 dm. high, slender but rather stiff, smooth; leaf-blades slightly canaliculate, 1.5-2 mm. wide; head 2-6 cm. long, the 3-4 spikes widely separate, the terminal long-clavate at base, the lateral suborbicular, 6-8 mm. wide, 3-5 mm. long with 2-12 widely radiating perigynia; perigynia 3.5-4 mm. long, 1.5 mm. wide, rounded at base, the margins scarcely elevated, entire, tapering into the serrulate bidentate beak more than ½ length of body, the teeth short.

TYPE LOCALITY: Strawberry Creek, El Dorado Co., California (Brainerd 160).

Boggy places, extending north from the San Bernardino Mts., through the Sierra Nevada to northern California; also in Oregon.

Locs.: Strawberry Creek, El Dorado Co., *Brainerd* 160; Yosemite, *Hall & Babcock* 3412; San Bernardino Mts., *Parish* 3274; Bluff Lake, San Bernardino Mts., *Parish* 2274, 3702 (in part), 3703; Crescent Lake, Mariposa Co., *Congdon;* Sequoia National Park, *Geo. B. Grant, Davidson* 2125; Kaweah River, Tulare Co., *Dudley* 1448, 3321; Panther Peak, Tulare Co., *Dudley* 1301; Camp Alta, Tulare Co., *Dudley* 977; Big Trees, Calaveras Co., *Bolander & Hillebrand* 2324; American Valley, *R. M. Austin;* Mineral, Tehama Co., *Eggleston* 7209; Three Rivers, *Dudley* 2801.

REFS.: CAREX ORMANTHA Mackenzie. *C. echinata* Murr. var. *ormantha* Fernald, Proc. Am. Acad. 37: 483, pl. 4, f. 89 (1902), excluding Conn. and R. I. specimens. *C. stellulata* Good. var. *ormantha* Fernald, Rhodora 4: 222, (1902); Parish, Bull. S. Cal. Acad. 5: 47 (1906).

25. C. phyllomanica W. Boott. Densely cespitose from slender creeping rootstocks, the culms 2.5-6 dm. high, obtusely triangular below, sharply above, smooth or nearly so; leaf-blades flat, 1.75-2.75 mm. wide; head 1.5-3.5 cm. long, the 3-4 spikes approximate, the terminal clavate at base, the lateral suborbicular, 7 mm. wide with 8-15 widely spreading perigynia; perigynia 3.75-4.5 mm. long, 1.5 mm. wide, round-truncate at base, the margins scarcely elevated, entire, tapering into the serrulate bidentate beak scarcely ½ length of body, the teeth short.

TYPE LOCALITY: Mendocino City, California (Bolander 4746).

Swampy places near the coast from northern California to Alaska.

Locs.: Mendocino City, *Bolander* 4746, 6193; Red Mt., Mendocino Co., *Bolander* 4739; Del Norte Co., *Davy;* Patricks Point, Humboldt Co., *Tracy* 4364; "California" (probably Santa Rosa) *Bigelow.*

REFS.: CAREX PHYLLOMANICA W. Boott in S. Wats. Bot. Cal. 2: 233 (1880); Kük., in Engler, Pflzr. 4^{20}: 237 (1909). "*C. sterilis* Willd," W. Boott, l. c. 236. "*C. vallicola* Dewey," W. Boott, l. c. 235. "*C. echinata* Murr." W. Boott, l. c. 237.

26. C. angustior Mackenzie. Densely cespitose, the culms very slender but strict, 1-3 dm. high, light brownish at base, somewhat roughened above; leaf- blades 0.5-2 mm. wide, flat or canaliculate; spikes 2-5, approximate or little separate, 4-6 mm. long, and nearly as wide, with 3-15 at length widely spreading perigynia, the terminal long clavate, the lateral rounded at base; scales as long as body of perigynia, ovate, acute,acuminate or cuspidate, yellowish-brown tinged with hyaline margins, keeled with the sharp midvein which is prominent to the tip; perigynia 2.5-3.5 mm. long, 1.25 mm. wide, plano-convex with slightly raised margins, yellowish-brown, impressed nerved ventrally, rather faintly nerved dorsally, tapering into a beak more than ½ length of body, with margins sparingly serrulate and apex bidentate.

TYPE LOCALITY: Fairfield, New York.

Boggy places from Newfoundland to Maryland west to Washington and California, where reported only from the Lake Tahoe region, and the extreme northern part.

Locs.: Fallen Leaf Lake, Lake Tahoe region, *Abrams* 4796; Bald Mt., Humboldt Co., *Tracy* 4532.

Refs.: Carex angustior Mackenzie in Rydb. Fl. Rocky Mts. 124 (1917). *C. stellulata* Good. var. *angustata* Carey, Gray's Manual 544 (1848), same type; Kük. in Engler, Pflzr. 4[20]: 230 (1909). *C. echinata* Murr. var. *angustata* Bailey, Mem. Torr. Club 1: 59 (1889). *C. sterilis* Willd. var. *angustata* Bailey, Bull. Torr. Club 20: 425 (1893). *C. Lcersii* Willd. var. *angustata* Mackenzie in Small & Carter, Flora Lancaster Co., Pa., 55 (1913).

27. C. illota Bailey. Cespitose with short prolonged rootstocks, the culms 1-2.5 dm. high, slender but strict, roughened above; leaf-blades short, 1.5-3 mm. wide, flat; spikes 3-5, forming a dense capitate head 6-10 mm. long, and nearly as wide; bracts absent; scales broadly ovate, obtuse, brownish-black with light midvein and scarcely hyaline margins; perigynia ovate, 3 mm. long, membranaceous, smooth, shining, nerved on both faces, rounded and spongy at base, brownish-black, at length spreading, the beak ⅓ length of body, smooth or nearly so, emarginate.

Type Locality: Colorado (Hall & Harbour 591).

High mountains, Wyoming and Colorado west to Washington and California. In California it is known only from the Sierra Nevada, where it is reported from Tulare Co. to El Dorado Co.

Locs.: Yosemite, *Congdon* 88, 89; Mono trail, *Bolander* 6207; Soda Spgs. of San Joaquin, Madera Co., *Congdon;* Tuolumne Soda Spgs., *Congdon;* Devils Basin and Lake Andrain, El Dorado Co., *Brainerd;* Camp Alta, Tulare Co., *Dudley* 992; Little Kern River, *Dudley* 1054; Kettle Mt., Fresno Co., *Dudley;* Kings River, Fresno Co., *Dudley* 3299.

Refs.: Carex illota Bailey, Mem. Torr. Club 1: 15 (1889), not Parish, Bull. S. Cal. Acad. 5: 52 (1906); Kük. in Engler, Pflzr. 4[20]: 227 (1909). *C. Bonplandii* Kunth. var. *minor* Boott, Proc. Acad. Phila. 77 (1863), same type. "*C. Bonplandii* Kunth. var. *angustifolia* Boott" W. Boott in S. Wats. Bot. Cal. 2: 233 (1880), mostly.

XI. Deweyanæ Tuckerm. Densely cespitose. Culms triangular. Sheaths not red-dotted or cross-rugulose. Spikes 3-8, gynæcandrous, pistillate or rarely staminate, simple. Lower one or two bracts often conspicuous. Perigynia plano-convex, light or yellowish-green, 3.5-5.5 mm. long, appressed, the body ovate or linear-oblong, strongly spongy at base, only upper half sharp-edged, round-tapering at base, nerved on the outer face, nerved or nerveless on the inner face, the beak bidentulate to deeply bidentate. Achenes lenticular. Style slender, jointed with achene, deciduous. Stigmas 2.

28. C. leptopoda Mackenzie. Rootstocks slender, elongate; culms slender, erect, 3-7.5 dm. high, little brownish tinged at base, roughened beneath head, exceeding leaves; leaf-blades 2.5-5 mm. wide, flat, smooth, pale green; spikes 4-7, ovoid-oblong or linear-oblong, the lower 1-3 separate, with 6-18 perigynia; lower bracts usually shorter than the head; scales not reddish-brown tinged, mostly cuspidate; perigynia ovate-lanceolate, 3.5-4 mm. long, 1.5 mm. wide, rounded, substipitate and somewhat spongy at base, obscurely nerved on outer face, nerved at base only on inner face, tapering into the serrulate shallowly bidentate beak about ⅓ length of body, the upper part of body not covered by scale.

Type Locality: Elk Rock, near Oswego, Clackamas Co., Oregon (Heller 10052).

Damp woods from British Columbia to California eastward to Idaho. In California it is found west of the higher parts of the Sierra Nevada as far south as Santa Cruz and Tulare Cos.

Locs.: Dinsmores Ranch, Humboldt Co., *Tracy* 4267; Oakland Hills, *Bolander;* Olema, Marin Co., *Davy* 4333; Mineral King, *Hall & Babcock* 5373; Eureka, *Dudley, Tracy* 921; Sherwood Valley, Mendocino Co., *Dudley;* Kaweah River, *Coville & Funston* 1344; Redwood Park, Santa Cruz Co., *Dudley;* Dutchflat, *Dudley;* San Antonio Creek, Calaveras Co., *Dudley;* Yosemite, *Brewer, Bolander* 6201; Coffee Creek, *Goldsmith* 18, 19*a*; McCloud, *Goldsmith* 8; Pine Ridge, Fresno Co., *Hall & Chandler* 238 (in part), *Kellogg & Harford* 1072; Redwood Creek, Humboldt Co., *Tracy* 4746.

Refs.: Carex leptopoda Mackenzie, Rydb. Fl. Rocky Mts. 124 (1917). "*C. Deweyana* Schw." W. Boott in S. Wats. Bot. Cal. 2: 236 (1880) in part; Kük. in Engler, Pflzr. 4[20]: 233 (1909), in small part.

29. C. Bolanderi Olney. (Fig. 15). Rootstocks slender, elongate, the culms slender, but strict, erect, 4-9 dm. high, brownish tinged at the base, little roughened beneath the head, exceeding leaves; leaf-blades 2.5-5 mm. wide, flat, smooth, pale green; spikes 4-8, linear-oblong or linear, the lower separate, with 8-30 perigynia; lower bracts usually shorter than the head; scales usually reddish-brown tinged, mostly acute or mucronate; perigynia lanceolate, 4-4.5 mm. long, 1-1.5 mm. wide, rounded, substipitate and somewhat spongy at base, nerved dorsally and at base on the inner face, rather abruptly tapering into the serrulate deeply bidentate beak ½ length of body, the body concealed by the scale.

Type Locality: "California, Yosemite Valley and Mariposa Big-tree grove." Bolander 6209 from the Yosemite is taken as the type.

Woods from British Columbia to California east to New Mexico, Utah and Western Montana. Widely distributed in California except in the higher ranges and drier parts.

Locs.: Yosemite, *Brewer* 1655, *Bolander* 6209, *Dudley*, *Abrams* 4422, *Hall & Babcock* 3411; Big Trees, Calaveras Co., *Hillebrand* 2315; Strawberry Creek, El Dorado Co., *Brainerd* 179, 180; Big Tree Valley, Mariposa Co., *Bolander* 4978 (in part); Shasta Spgs., *Heller* 8025; South Los Guilicos Valley, Sonoma Co., *Bioletti;* Oakland, *Bolander;* Santa Cruz, *Bolander;* Waterman Cañon, San Bernardino Mts., *Parish* 2486, 6315, *Reed;* Santa Rosa, *Congdon* 370; Mt. Tamalpais, *Heller* 5715, *Piper* 6469, *Davy;* Strawberry Valley, *Hasse;* Seven Oaks, San Bernardino Mts., *Geo. B. Grant* 4039; Eight Mile (Yosemite to Wawona), *Jepson* 4298; Tassajara Hot Spgs., *Elmer* 3131, 3134; Comptche, Mendocino Co., *McMurphy* 430; Lake Tenaya, *Congdon;* Bald Mt., Humboldt Co., *Tracy* 4549; Three Creeks, Humboldt Co., *Tracy* 4371; upper Rush Creek, Trinity Co., *Yates* 471; Lucia, Monterey Co., *Hall* 9992; Eureka, *Abrams* 6219; Deer Creek, Tulare Co., *Dudley* 629; Hagas, Santa Clara Co., *Dudley;* Glenwood, Santa Cruz Co., *Dudley;* San Mateo Creek, San Mateo Co., *Dudley;* Mt. Shasta, *Jepson* 54*a*; Emigrant Gap, *M. E. Jones* 3535; Jones Hill, El Dorado Co., *Shockley* 605; Clark's Ranch, *Torrey* 548; Adobe Cañon, Sonoma Co., *Bioletti* 20; Napa Valley, *Bigelow;* Lake San Andreas, San Mateo Co., *Davy* 762; Trinidad, Humboldt Co., *Tracy* 4747.

Fig. 15. Carex Bolanderi Olney.

a, inflorescence, × 1; *b*, scale, × 7; *c*, perigynium, × 7.

Refs.: Carex Bolanderi Olney, Proc. Amer. Acad. 7: 393 (1868); Parish, Bull. S. Cal. Acad. 5: 47 (1906); Kük., in Engler, Pflzr. 4[20]: 236 (1909). "*C. Deweyana* Schw." in part, and *C. Deweyana* Sch · · *Boland* · W. Boott in S. Wats. Bot. Cal. 2: 236 (1880). "*C. bromoides* Schk." W. Boott, l. c. 2: 230 (1880).

In the original description specimens are cited as follows: "*Brewer* 1665; *Dr. William Hillebrand* 2313; *Bolander* 6201, 6209." (The Hillebrand number should be 2315). All of these are the present species, except *Bolander* 6201, which is *Carex leptopoda* and does not answer Olney's description. Under the circumstances *Bolander* 6209 is taken as the type.

XII. Ovales Kunth. Densely cespitose or (rarely) with short-prolonged rootstocks. Culms triangular. Opaque part of leaf-sheaths not red-dotted or cross-rugulose, but sometimes green striate. Spikes 2 or 3 up to 20, with several to many perigynia, the terminal gynæcandrous, the lateral pistillate or gynæcandrous, simple, the inflorescence varying from capitate to moniliform. Lower bracts from inconspicuous to very conspicuous. Perigynia varying from scale-like or flat (except where distended by achene) to thick and plano convex, the body subulate to reniform, narrowly to broadly wing-margined, appressed or ascending or spreading, little corky-thickened at base, prominently beaked, the beak bidentate or obliquely cut, often becoming bidentulate, usually serrulate on the margins. Style slender, jointed with achene, deciduous, its base scarcely thickened. Achenes lenticular. Stigmas 2.

30. C. feta Bailey. (Fig. 16). Densely cespitose, the culms 5-12 dm. high, obtusely triangular, smooth; lower nodes exposed; leaves with blades 2.5-4 mm. wide, flat, the sheaths hyaline only at mouth; head 2-8 cm. long, the spikes 5-15, greenish, aggregated or more or less separate, short-oblong or suborbicular, 6-10 mm. long, 4-6 mm. wide, short clavate at base, rounded at apex, the 20-40 perigynia appressed, or spreading in age; bracts inconspicuous; scales ovate, greenish straw-colored or light brownish tinged, obtusish or acutish, shorter than perigynia; perigynia plano-convex, thickish, ovate, greenish, 3-3.5 mm. long, 1.75-2 mm. wide, nearly nerveless ventrally, rounded to a substipitate base, narrowly margined, serrulate above, contracted into a flat serrulate reddish tipped beak less than ½ length of body, obliquely cut dorsally and minutely bidentulate.

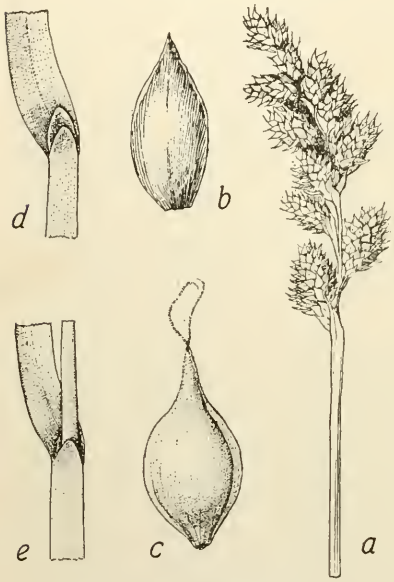

Fig. 16. Carex feta Bailey.
a, inflorescence, × 1; *b*, scale, × 8; *c*, perigynium, × 8; *d*, culm and sheath, × 2; *e*, sheath, × 2.

Type Locality: Cloverdale, Sonoma Co., California (Bolander 50).

A characteristic species of the Pacific Coast states, ranging from British Columbia to California, where it is found in the northern portion and throughout the Sierra Nevada and in the southern mountains and in the Coast Ranges as far south as Santa Clara Co.

Locs.: Cloverdale, *Bolander* 50; Santa Rosa to Ukiah, *Bolander* 3864; Yosemite, *Bolander* 6216, *Brewer* 1642; Clarks Ranch, *Torrey* 551 (in part); "Carex lagopodioides" Mark West Creek, *Bigelow;* Big Trees, Calaveras Co., *Hillebrand* 2305 (in part), 2317 (in part); Hetch-Hetchy, *Hall & Babcock* 3358; Sisson, *Hall & Babcock* 4061; Mt. Shasta, *Jepson* 53*a*; Humboldt Co., *Tracy* 4281; Dinsmores Ranch, Humboldt Co., *Tracy* 2906; Siskiyou Co., *Butler* 807; Mariposa Co., *Congdon*; San Juan, *Nevin;* San Bernardino Co., *Parish* 2214; Calaveras Big Trees, *Dudley;* New York Falls, Amador Co., *Hansen* 639; Merced River, Mariposa Co., *Congdon;* El Dorado Co., *C. A. Gross;* Sherwood Valley, Mendocino Co., *Dudley;* Arnolds Run, Santa Clara Co., *Dudley* 4060; Mineral King, *Dudley* 1647; East Hot Spgs., *Dudley;* Oroville, *Heller* 10781; Avery, Calaveras Co., *A. L. Grant* in 1915; Columbia, Tuolumne Co., *Jepson* 6411; Sissons and Slippery Ford, El Dorado Co., *Brainerd* 208, 207; Yosemite, *Dudley, Jepson* 4265, 4297; Quincy, *Jepson* 4140; Alder Point, Humboldt Co., *Tracy* 4734; "California," *Bolander* 8343; Kenwood, Sonoma Co., *Bioletti* 9; Shasta City, *A. Wood;* Auburn, Placer Co., *Ames;* Trinity Co., *Blankinship;* Avery, Calaveras Co., *Eggleston* 9128, 9454; Sisson, *Dudley.*

The first specimens cited above down to and including *Hillebrand* 2317 are in the Gray Herbarium and are the specimens on which the species is based with the addition of (*1*) *Hall* 589 from Oregon, which also belongs here, (*2*) a specimen collected at Summit Camp by Kellogg, which is C. fracta Mackenzie, and (*3*) a specimen collected at San Bernardino by Parish, not seen by me.

Refs.: Carex feta Bailey, Bull. Torr. Club 20: 417 (1893); Parish, Bull. S. Cal. Acad. 5: 50 (1906). *C. straminea* Willd. var. *mixta* Bailey, Proc. Am. Acad. 22: 151 (1886), same type; Kük. in Engler, Pflzr. 4[20]: 207 (1909). "*C. lagopodioides* Schk." W. Boott in S. Wats. Bot. Cal. 2: 237 (1880). "*C. adusta*, Boott" W. Boott, l. c. 238 (in part). "*C. cristata* Schw. var. *mirabilis* W. Boott," l. c.

31. C. fracta Mackenzie n. sp. Densely cespitose, the culms 5-12 dm. high, obtusely triangular, smooth or nearly so; lower nodes not exposed; leaf-blades 3-5 mm. wide, flat, the sheaths very thin ventrally, strongly prolonged at mouth above

insertion of blade and very fragile; head 2.5-7.5 cm. long, the spikes 7-15, greenish, aggregated or the lower slightly separate, short oblong or obovoid, 8-12 mm. long, 5-7 mm. wide, rounded or short-clavate at base, rounded at apex, the 15-30 perigynia appressed or ascending in age; bracts inconspicuous; scales lance-ovate, greenish with hyaline margins, acuminate or short-cuspidate, shorter than the perigynia; perigynia lance-ovate, thickish over achene, 3-4.5 mm. long, greenish, strongly nerved ventrally, round-tapering to a stipitate base, narrowly margined, serrulate above, tapering into the serrulate bidentate beak about length of perigynium body.

Type Locality: Mt. Shasta, California (Pringle), Aug. 23, 1881 (sheet 817810 U. S. Nat. Herb.).

Washington and Oregon, south to northern California, and throughout the Sierra Nevada and in the southern mountains.

Locs.: Mariposa Grove, *Bolander* 4975; Big Tree Grove, *Dudley;* Meisners Ranch and Slippery Ford, El Dorado Co., *Brainerd;* Yosemite, *Torrey, Jepson* 4333, *Hall & Babcock* 3409, *Congdon, Geo. B. Grant* 4206, *Abrams* 4400; North Fork San Joaquin, Madera Co., *Congdon;* Pine Ridge, Fresno Co., *Hall & Chandler* 340; San Bernardino Mts., *Parish* 169, 2530, 6316, *Abrams* 2767; San Jacinto Mts., *Hall* 2665, *Hasse;* Strawberry Peak, *Abrams* 1967; Seven Oaks, San Bernardino Co., *Geo. B. Grant* 4074; Jonesville, Butte Co., *Hall* 9786; Mt. Wilson, Los Angeles Co., *Grant* 6692 (in part); San Bernardino Co., *Grant, Parish* 1698; Mt. Sanhedrin, Lake Co., *Heller* 5952; Mt. Shasta, *Pringle, Goldsmith* 38; Cow Creek, Tuolumne Co., *Jepson* 6520; Black Fox Mts., Siskiyou Co., *Dudley;* Dry Creek, Tulare Co., *Dudley* 1371; Soda Spgs., Tulare Co., *Dudley* 2342; Lloyd Mt., Tulare Co., *Dudley* 837; Deer Creek, Tulare Co., *Dudley* 650; Kern River, *Dudley;* Sissons, *Brainerd* 189; Little Yosemite, *Jepson* 3160, 4403; Pitt River, Shasta Co., *H. E. Brown* 286 (in part); Big Trees, Calaveras Co., *Hillebrand* 2317 (in part); Summit Camp, *Kellogg;* Kings River, Fresno Co., *Dudley* 3263.

Refs.: Carex fracta Mackenzie. *C. specifica* Bailey, Mem. Torr. Club 1: 21 (1889), in small part; Parish, Bull. S. Cal. Acad. 5: 50 (1906); Mackenzie in Bull. Torr. Club 43: 602 (1917). "*Carex adusta* Boott" W. Boott in S. Wats. Bot. Cal. 2: 238 (1880), in greater part. *C. scoparia* var. *fulva* W. Boott, l. c. 237, in small part. *C. specifica* Bailey f. *brevifructus* Kük. in Engler, Pflzr. 4^{20}: 199 (1909), type from Mt. Adams, Washington, *Suksdorf* 3099..

32. C. straminiformis Bailey. Densely cespitose, the culms 2.5-4 dm. high, firm but slender, slightly roughened beneath head; leaf-blades 2-3 mm. wide; head 1.5-2.5 cm. long, containing 3-6 closely aggregated suborbicular spikes 6-9 mm. long and nearly as wide with many spreading-ascending perigynia; scales ovate-lanceolate, acute, reddish-brown with lighter midvein and hyaline margins; perigynia broadly ovate, 5 mm. long, 3 mm. wide, serrulate to middle, strongly winged to the rounded base, lightly nerved dorsally, nerveless or nearly so ventrally, abruptly beaked, the beak flat, bidentate, ⅓ length of body.

Type Locality: Mt. Shasta, California (Brewer).

High mountain summits in the Sierra Nevada from Tulare Co. north to Mt. Shasta; also on the higher peaks of Oregon and Washington.

Locs.: Mt. Shasta, *Brewer* 1397, 1399, *Geo. B. Grant* 5129, 5116, *Pringle, Copeland* 3893; Carson Pass, *Brewer* 2125; Lassen Peak, *Brewer* 2184; Carys Peak, Alpine Co., *Brewer* 2125; Pyramid Peak, El Dorado Co., *Brewer* 2139, 2143; Ebbetts Pass, *Brewer* 1986, 2083; Silver Mt., *Brewer* 2045; Mt. Tallac, *Hall & Chandler* 4617; Meisners Ranch, El Dorado Co., *Brainerd;* Pyramid Peak, El Dorado Co., *Hall & Chandler* 4742; Lake Tahoe, *McGregor* 103; Lake Tenaya, *Congdon;* Alta Meadows, Tulare Co., *Geo. B. Grant;* Sonora Pass, *A. L. Grant* 353, *Jepson* 6578; Mineral King, *Dudley* 1599; Farewell Gap, *Dudley* 1126; Kaweah region, *Dudley* 1257, 1705; Mineral King, *Coville & Funston* 1500; Cottonwood Lakes near Mt. Whitney, *Jepson* 5067; Webber Lake, *Leiberg* 5242; Mt. Buena Vista, Mariposa Co., *Congdon;* upper San Joaquin, Madera Co., *Congdon;* Stanislaus Forest, Alpine Co., *Eggleston* 9619; upper Bear Creek, Tulare Co., *Dudley* 2892.

Refs.: Carex straminiformis Bailey, Mem. Torr. Club 1: 24 (1889); Kük. in Engler, Pflzr. 4^{20}: 195 (1909). *C. straminea* Willd. var. *congesta* Boott, ex Olney, Proc. Am. Acad. 7: 393 (1868), same type; W. Boott in S. Wats. Bot. Cal. 2: 235 (1880). *Carex straminea* Willd. var. *congesta* Boott, which was published by Olney with the description "spica congesta, squamis castaneis," seems to have included two species, the one here described and *Carex pachycarpa* Mackenzie. Four specimens of Brewer cited in numerical order are referred to, of which nos. 1375 and 1398 are *C. pachycarpa* and nos. 1397 and 1399 the present species. The specimens referred to by Bailey in his description of Carex straminiformis are those distributed by Olney in his Exsiccatæ (no. 20). These specimens represent the present species, and are to be taken as its type. Unfortunately Olney in making his distribution used a consolidated form of label and it is impossible to tell from it who collected the particular specimen. One can only infer that it is one of Brewer's.

33. C. multicostata Mackenzie. Culms rather stout, 3-9 dm. high, slightly roughened beneath head; leaf-blades 2.5-6 mm. wide; spikes about 10, oblong or oblong-ovoid, 8-16 mm. long, 6-8 mm. wide, with 20-30 perigynia; scales ovate, obtuse to acute, reddish-brown with lighter midvein and conspicuous hyaline margins; perigynia appressed, ovate, 3.5-4.5 mm. long, 2-2.25 mm. wide, serrulate to below middle, several nerved on inner face, winged to the rounded base, abruptly contracted into the beak 1 mm. long.

Type Locality: Bear Valley Dam, San Bernardino Co., California (Parish 3609).

Mountains of Southern California; Sierra Nevada.

Locs.: Bear Valley Dam, San Bernardino Co., *Parish* 3609; San Jacinto Mts., *Hall* 2492; Truckee River, Nevada Co., *Davy*.

Refs.: Carex multicostata Mackenzie, Bull. Torr. Club 43: 604 (1917). "*C. specifica* Bailey" Parish, Bull. S. Cal. Acad. 5: 50 (1906), in small part. "*C. festiva stricta* Bailey" Parish, l. c. 53, in small part.

34. C. subfusca W. Boott. Cespitose, the culms 2-6.5 dm. high, slender but firm, smooth or very nearly so; leaf-blades 1.5-3 mm. wide; head oblong or ovoid, 1-2 cm. long, the spikes 4-8, well defined but closely aggregated, ovoid or oblong, 4-10 mm. long, 2.5-4.5 mm. wide, rounded at apex, rounded or somewhat tapering at base, the 8-15 perigynia appressed-ascending; scales ovate, acute, brownish with lighter midvein and inconspicuous hyaline margins; perigynia ovate, 3-3.5 mm. long, 1-1.5 mm. wide, plano-convex, thickish, winged to the rounded base, serrulate above, faintly nerved ventrally, contracted into beak ½ length of body or more, the beak flat and serrulate nearly to tip, shallowly bidentate.

Type Locality: Lake Tahoe (Kellogg) and near Virginia City, Nevada (Bloomer).

California in the northern mountains and throughout the Sierra Nevada and in the higher southern mountains and in the southern Coast Ranges; extending north into Oregon and east into Arizona.

Locs.: Summit Camp, Sierra Nevada, *Kellogg;* Lower Sardine Lake, Sierra Co., *Hall & Babcock* 4487; Tallac and Mrs. Watson's, El Dorado Co., *Brainerd;* Salmon Creek, Tulare Co., *Hall & Babcock* 5162 (in part); San Gorgonio Mts., *Hall* 7617; Mt. San Antonio, *Abrams* 1933; San Jacinto Mts., *Hasse, Reed* 2483; Nevada Falls, *Bioletti;* Bierstadt Peak, Nevada Co., *Davy* 3211; Weaverville, Trinity Co., *Yates* 297; Cuyamaca Mts., *Brandegee;* San Bernardino Mts., *Parish* 3261, 3272, 3270, 3272*a*, 2529; Mariposa Co., *Congdon;* Cuyamaca Lake, Orange Co., *Abrams* 3876; Tassajara Hot Spgs., *Elmer* 3133, *Dudley;* Russian River, *Bolander* 3876; San Antonio Mts., *Hall* 1524; Smith Mt., San Diego Co., *Stokes;* Squaw Valley, Placer Co., *L. S. Smith* 555; Cow Creek, Tuolumne Co., *Jepson* 6520*a*; Chico Meadows, Butte Co., *Heller* 12018; Bisses, Kern Co., *Dudley* 461; Grant Park, *Dudley* 1196; Yosemite, *Dudley;* Mt. San Gorgonio, *Abrams & McGregor* 747; Laguna, *Schoenefeldt* 3602; Davis Creek, *R. M. Austin* 490; Big Tree Grove, Calaveras Co., *Brewer* 2354; Castella, Shasta Co., *Piper* 6470; Smiths Mt., San Diego Co., *McClatchie;* Pit River Ferry, Shasta Co., *H. E. Brown* 286 (in part); San Antonio Mts., *Johnston* 1636; Mt. Eddy, Siskiyou Co., *Eggleston* 11662; Siskiyou Co., *Dudley*.

Refs.: Carex subfusca W. Boott in S. Wats. Bot. Cal. 2: 234 (1880); Parish, Bull. S. Cal. Acad. 5: 53 (1906). "*C. festiva stricta* Bailey" Parish, Bull. S. Cal. Acad. 5: 53 (1906) in part. *C. macloviana* D 'Urv. var. *subfusca* Kük. in Engler, Pflzr. 4^{2} ^{b}: 197 (1909).

35. C. praticola Rydb. Cespitose, the rootstock elongate; culms slender, often nodding above, 2.5-6 dm. high, roughened beneath the head, much exceeding the leaves; leaf-blades 1-2 mm. wide, flat; spikes 2-6, elliptic, 6-16 mm. long, 5 mm. wide, the upper contiguous, the lower remote, in a more or less moniliform head; bracts except lowest not developed; scales ovate, obtuse or acutish, brownish tinged, shining, with green midvein and hyaline margins; perigynia appressed, concealed by scales, ovate-lanceolate, 4.5-6.5 mm. long, narrowly winged, round-tapering at the base, lightly nerved dorsally, nearly nerveless ventrally, pale green, membranaceous, tapering to a short hyaline-tipped beak, the beak bidentulate, ⅓ length of body, obliquely cut and fissured dorsally.

Type Locality: Godthaab, Greenland (J. Vahl).

Meadows and open woods, Greenland to Alaska, south to Maine, Colorado and northern California, where it is confined to the northern Coast Ranges.

Loc.: Eureka, *Tracy* 4421, 4641.

Refs.: Carex praticola Rydb. Mem. N. Y. Bot. Gard. 1: 84 (1900). *C. pratensis* Drejer, Revis. Car. Bor. 24 (1841), same type, not Hose 1797; Kük. in Engler, Pflzr. 4[20]: 198 (1909).

36. C. Tracyi Mackenzie n. sp. Cespitose, the culms 1.5-6 dm. high, strict, slightly roughened on angles above, exceeding leaves; leaf-blades 2-3 mm. wide, deep green; head stiff, narrow, 18-35 mm. long, the spikes 4-7, aggregated or the lower a little separate, ovoid or short-oblong, 7-10 mm. long, 5-8 mm. wide, obtuse at apex, the perigynia numerous, appressed-ascending; scales ovate, acute, covering perigynia, brownish-red with lighter midvein and hyaline margins; perigynia ovate, 4-5 mm. long, 2 mm. wide, membranaceous-winged to the rounded base, serrulate above, strongly nerved dorsally and ventrally, abruptly beaked, the beak obliquely cut dorsally, at length bidentulate, dark reddish-brown at tip, not hyaline at orifice, shorter than body.

Type Locality: Bald Mt., Humboldt Co., California (Tracy 4547).

Northern California to British Columbia; in California it is confined to the northern Coast Ranges

Loc.: Bald Mt., Humboldt Co., *Tracy* 4547.

Refs.: Carex Tracyi Mackenzie. "*C. leporina* L." Piper & Beattie, Fl. Nw. Coast 75 (1915). This species, which bears a very strong resemblance to the widely distributed *Carex leporina* L., differs from that species in the perigynium beak not being bidentate and in being darker colored; also the perigynia are strongly nerved ventrally. It has been collected in considerable abundance north of California.

37. C. phæocephala Piper. (Fig. 17). In large stools from densely matted rootstocks, the culms 1-3 dm. high, more or less roughened beneath head, exceeding leaves; leaves bunched at the base, the blades more or less involute, 1.5-2 mm. wide; spikes 2-5 (rarely 7), aggregated, 6-12 mm. long, 5-8 mm. wide, forming an erect head 12-25 mm. long; lowest bract occasionally developed; scales ovate, acute, dark brownish, with strongly hyaline margins and lighter midvein, covering perigynia; perigynia ascending, oblong-ovate, 4.5 mm. long, 1.8 mm. wide, round-tapering at the base, strongly nerved dorsally, obscurely nerved or nerveless ventrally, contracted into a minutely bidentate, serrulate beak about 1 mm. long.

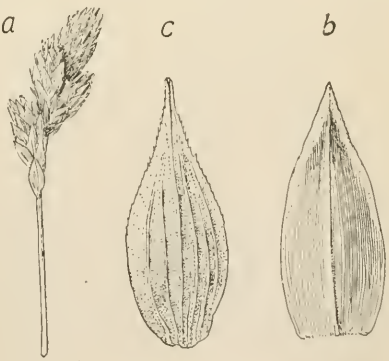

Fig. 17. Carex phæocephala Piper.

a, inflorescence, × 1; *b*, scale, × 8; *c*, perigynium, × 8.

Type Locality: Oregon (Elihu Hall 583).

Mountain summits, Alberta to Colorado and west to California, British Columbia and Alaska; in California confined to the higher peaks of the Sierra Nevada from Mt. Whitney to Mt. Shasta.

Locs.: Denels Peak, Tulare Co., *Hall & Babcock* 5511; Sawtooth Peak, Tulare Co, *Hall & Babcock* 5675; Mt. Tallac, *Hall & Chandler* 4627; Stanislaus Peak, Alpine Co., *A. L. Grant* 536; Kaweah River, *Dudley* 1258; Mt. Shasta, *Copeland* 3568; Little Kern River, *Purpus* 5643; Mt. Whitney, *Vernon Bailey* 2048; Whitney Meadows, *Coville & Funston* 1661; Mt. Whitney, *Jepson* 1078.

Refs.: Carex phæocephala Piper, Contr. U. S. Nat. Herb. 11: 172 (1906). *C. leporina* L. var. *americana* Olney, Proc. Am. Acad. 8: 407 (1872), name only, type from Oregon, *Hall* 583; Bailey, Proc. Am. Acad. 22: 152 (1886). "*C. leporina* L." Bailey in Coulter Manual Bot. Rocky Mts., 396 (1885). "*C. Preslii* Steud." Bailey, Mem. Torr. Club 1: 52 (1889). "*C. petasata* Dewey" Holm, Am. Jour. Sci. (4) 16: 20 (1903); Kük. in Engler, Pflzr. 4^{20}: 209 (1909).

38. C. leporinella Mackenzie. Very densely cespitose from short creeping rootstocks; culms smooth, 1.5-3 dm. high, exceeding leaves; spikes 3-6, gynæcandrous, forming a head 1.5-3 cm. long, the spikes narrowly oblong-oval, 6-15 mm. long, 3-5 mm. wide, short-clavate at base, the 8-20 perigynia appressed; lowest bract occasionally somewhat developed; scales ovate, acute, reddish-brown with lighter midvein and hyaline margins, covering perigynia; perigynia 4 mm. long, scarcely 1 mm. wide, very narrowly margined, serrulate above middle, finely striate dorsally, few-nerved ventrally, tapering at base and at apex into the short (1 mm. long) beak, which is hyaline at apex and obliquely cut dorsally.

Type Locality: Pyramid Peak, El Dorado Co., California (Hall & Chandler 4716).

Summits of high mountains, Washington to California; collected so far in California only in the central part of the Sierra Nevada.

Locs.: Pyramid Peak, El Dorado Co., *Hall & Chandler* 4716; Tuolumne Soda Spgs., *Congdon;* Summit Valley, Sierra Nevada, *Pringle.*

Refs.: Carex leporinella Mackenzie, Bull. Torr. Club 43: 605 (1917). "*C. tenuirostris* Olney" Bailey, Mem. Torr. Club 1: 15 (1889), as to plant described.

39. C. Davyi Mackenzie. Densely cespitose, the culms 2.5-3.5 dm. high, smooth, erect, slender, much exceeding leaves; leaf-blades 1.5-2.5 mm. wide; head about 2.5 cm. long, the spikes usually 3, approximate, oblong-obovoid, 12-18 mm. long, 6-8 mm. wide, with 10-15 appressed perigynia; bracts not developed; scales oblong-ovate, very obtuse, chestnut with lighter center and hyaline margins, about ½ length of perigynia; perigynia thin, 7.5 mm. long, 2 mm. wide, strongly many striate dorsally, striate ventrally, contracted and substipitate at base, narrowly margined to base and serrulate to middle, the sharply bidentate reddish tinged beak not differentiated from body, the apex obliquely cut dorsally.

Type Locality: Truckee River, Placer Co., California (Davy 3266).

Sierra Nevada, from Placer Co. to Tulare Co.

Locs.: Devils Basin and Snowy Cascade, El Dorado Co., *Brainerd;* Truckee River, Placer Co., *Davy* 3266; Big Trees, Calaveras Co., *Hillebrand* 2322; Mt. Whitney, *Dudley* 2484.

Refs.: Carex Davyi Mackenzie, Bull. Torr. Club 43: 606 (1917). "*C. siccata* Dewey" W. Boott in S. Wats. Bot. Cal. 2: 230 (1880).

40. C. specifica Bailey. Culms 2.5-4.5 dm. high, smooth or nearly so, erect, stiff, much exceeding leaves; leaf-blades 2-3.5 mm. wide, flat or canaliculate; head globose, 1.5-2 cm. long and nearly as wide, the spikes 6-10, oblong-ovoid, 6-9 mm. long, 4 mm. wide, tapering at each end, gynaecandrous with 8-15 appressed perigynia; bracts little developed; scales lance-ovate, exceeded by perigynia, acute, reddish-brown with lighter midvein and narrow hyaline margins; perigynia thin, plano-convex, 6 mm. long, 1.5 mm. wide, several to many nerved on both faces, contracted and substipitate at base, narrowly winged to base, serrulate above, tapering into a bidentate beak ⅓ length of body, the tip light reddish tinged and obliquely cut dorsally.

Type Locality: Silver Valley, Alpine Co. (Brewer 1969).

Sierra Nevada, from El Dorado Co. to Tulare Co.

Locs.: Volcano Creek, upper Kern River, Tulare Co., *Hall & Babcock* 5472; Yosemite, *Abrams* 5443, *Hitchcock;* Cone Meadow, Tulare Co., *Dudley;* Mountain Lake, Tulare Co., *Dudley* 965; Marble Fork, Kaweah River, *Dudley* 1790; Echo Lake, Slippery Ford and Little Lake, El Dorado Co., *Brainerd* 188, 191; Silver Valley, Alpine Co., *Brewer* 1969; head of Tuolumne River, *Brewer* 1774; Ebbetts Pass, *Brewer* 2020, 2079; Miller Creek near Rubicon River, *Leiberg* 5343; Soda Spgs. of San Joaquin, Madera Co., *Congdon;* Cahoon Meadow, Tulare Co., *Dudley.*

Refs.: Carex specifica Bailey, Mem. Torr. Club 1: 21 (1889); Kük. in Engler, Pflzr. 4[20]: 198 (1909). *C. scoparia* Schk. var. *fulva* W. Boott in S. Wats. Bot. Cal. 2: 237 (1880), excluding *Hillebrand* 2317 and Oregon specimens; same type. "*C. arida* Schw. & Torr." W. Boott, l. c. *C. lancifructus* Mackenzie, Bull. Torr. Club 43: 607 (1917), type from Volcano Creek, Tulare Co., *Hall & Babcock* 5472.

41. **C. unilateralis** Mackenzie n. sp. Cespitose from very short creeping rootstocks, the culms erect, slender, obtusely triangular, slightly roughened above; leaf-blades 2-4 mm. wide, flat, little roughened; spikes 6-20, gynæcandrous, ovoid, 5 mm. long, 3-4 mm. wide, densely aggregated into an ovoid head 1-3 cm. long; lowest 2-3 bracts elongated and much exceeding head, dilated and strongly brownish hyaline-margined at base, the lowermost erect, appearing like a continuation of the culm, the head unilateral; scales ovate, strongly cuspidate, nearly equaling perigynia, reddish with lighter center and narrow hyaline margins; perigynia appressed, ovate-lanceolate, thin, 3-4 mm. long, 1.5 mm. wide, nerveless or nearly so ventrally, rounded and substipitate at base, wing-margined serrulate above, tapering into a short beak, the beak flat, serrulate nearly to apex, reddish tipped, not hyaline, at length bidentate.

Type Locality: Alton, Humboldt Co., California (Tracy 3783).

Wet meadows and copses, northwestern California to British Columbia.

Loc.: Alton, Humboldt Co., *Tracy* 3783.

Refs.: Carex unilateralis Mackenzie. "*C. athrostachya* Olney" Kük. in Engler, Pflzr. 4[20]: 193, f. 32A, B (1909).

42. **C. athrostachya** Olney. (Fig. 18). Densely cespitose, the rootstocks very short, the culms 1-9 dm. high, strict, slender, sharply triangular, smooth or somewhat roughened above; leaf-blades 1.5-2.5 mm. wide; spikes 4-20, ovoid, 5 to 7 mm. long, 3-4 mm. wide, densely aggregated into an ovoid head, 1-3 cm. long; lowest 2-3 bracts elongated and much exceeding head, dilated and strongly brownish hyaline-margined at base, spreading; scales ovate or lanceolate-ovate, shorter than the perigynia, acute or short-cuspidate, brown with hyaline margins; perigynia ascending, ovate-lanceolate, thin, 3-4 mm. long, 1.5 mm. wide, more or less nerved ventrally, rounded and substipitate at base, wing-margined, serrulate above, tapering into a beak 1 mm. long, the tip slender, terete, brownish, hyaline at apex, obliquely cut dorsally.

Type Locality: Yosemite Valley, California (Brewer 1650).

Wet meadows and copses, Saskatchewan to Colorado, California and Yukon. In California it is found in the northern counties, throughout the Sierra Nevada, in the San Bernardino Mts., and in the Coast Ranges as far south as Mendocino Co.

Locs.: Beebe's Ranch, Humboldt Co., *Tracy* 3373; Kennedys Meadows, *A. L. Grant* 222; Cow Creek, Tuolumne Co., *Jepson* 6518; Sissons, *Goldsmith* 13, 13*a*; Hockett Meadow, Tulare Co., *Dudley* 1030; Kern Lakes, *Dudley* 2046; Yosemite, *Abrams* 4633, *Geo. B. Grant* 4280; Lake Tahoe region, *Abrams* 4872; Yosemite, *Brewer* 1650, *Bolander* 6213, *Canby*, *Torrey* 552; Jess Valley to Blue Lake, *Griffiths & Hunter* 417; Hetch-Hetchy, *Congdon*, *Jepson* 3477; Sierra Nevada, *Lemmon;* Bear Valley, *Parish* 3459, 3271, 1573; Kaweah region, *Purpus* 5144; Mineral King, *Coville & Funston* 1405; Truckee, *Hitchcock* 256, *L. S. Smith* 673; upper San Joaquin, Madera Co., *Congdon;* Sissons, *Hall & Babcock* 4062; Truckee River, Placer

Fig. 18. Carex athrostachya Olney.

a, inflorescence, × 1; *b*, scale, × 8; *c*, perigynium, × 8.

Co., *Davy* 3267; Dewitts, Lassen Co., *Davy* 3298; Echo, Snowy Cascade and Mrs. Watson's, El Dorado Co., *Brainerd;* Donner Lake, *Heller* 6915; San Bernardino Mts., *Parish* 1573, 3271; Siskiyou Co., *Butler* 854; Big Trees, Calaveras Co., *Brewer* 2311; Medicine Lake, *Goldsmith* 32; Ebbetts Pass, *Brewer* 2013 (in part); East Hot Spgs., *Dudley;* Kaweah Meadow, Tulare Co., *Dudley* 2213; Kaweah Peaks, *Dudley* 2081; Kern River, *Dudley* 685; Sherwood Valley, Mendocino Co., *Dudley;* Mt. Eddy, Siskiyou Co., *Copeland* 3866; Silver Valley, *Brewer* 1964 (in part); Big Trees, Calaveras Co., *Hillebrand* 2311; Whitney Meadows, *Coville & Funston* 1615.

Refs.: Carex athrostachya Olney, Proc. Am. Acad. 7: 393 (1868); W. Boott in S. Wats. Bot. Cal. 2: 234 (1880); Parish, Bull. S. Cal. Acad. 5: 54 (1906). *C. tenuirostris* Olney, Am. Nat. 8: 214 (1874), type from northern Wyoming, *Parry* 284. "*C. Bonplandii* Kunth." Bailey, Proc. Am. Acad. 22: 152 (1886) in part. *C. macloviana* D'Urv. var. *pachystachya* Bailey, f. *involucrata* Kük. in Engler, Pflzr. 4[20]: 197 (1909), type from Montana, *Rydberg* 3041. *C. athrostachya* Olney var. *minor* Olney, S. Wats. Bot. King 367 (1871), type from California.

In the original description of Carex athrostachya specimens are cited as follows: "California, Yosemite Valley, June 17, *Brewer* 1650; *Hillebrand* 2311, a var.; *Bolander* 6213; Silver Valley, alt. 7400 feet, *Brewer*, a variety." The specimens characterized as representing a variety are small plants similar to the type specimens of *Carex tenuirostris* Olney.

43. C. festivella Mackenzie. Culms slender, annual, 3-10 dm. high, smooth or roughened beneath the head; leaf-blades 2-6 mm. wide; spikes 5-20, densely aggregated into a suborbicular to oblong-ovoid head, 12-25 mm. long, 10-18 mm. wide, the spikes ovoid, 5-12 mm. long, 4-8 mm. wide; bracts inconspicuous; scales ovate, obtuse to acutish, dark chestnut to brownish-black with light midvein; perigynia 15-30 to a spike, appressed, 3.75-5 mm. long, 1.5-2 mm. wide, straw-colored or light brownish at maturity, winged, lightly nerved ventrally, tapering into a serrulate, shallowly bidentate beak ⅓ the length of the whole.

Type Locality: Albany Co., Wyoming (Nelson 3275).

Mountains, Alberta to Wyoming, west to Washington and California, where it is confined to the Sierra Nevada (from Tulare Co. to El Dorado Co.) and to the White Mts.

Locs.: Meisner's Meadows, Brians and Strawberry Creek, El Dorado Co., *Brainerd* 222, 223, 226 (in part); Kaweah River, *Dudley* 1413; Kaweah Meadow, *Dudley* 2208; Sonora Pass, *Brewer* 1864; Ebbetts Pass, *Brewer* 2012; Sierra Nevada, *Lemmon;* White Mts., *Jepson* 7372.

Ref.: Carex festivella Mackenzie, Bull. Torr. Club 42: 609 (1915).

44. C. nubicola Mackenzie. Densely cespitose, the culms 1-3.5 dm. high, erect or recurved; leaf-blades 2-3 mm. wide; head ovoid or globular, 12-18 mm. long, 9-18 mm. wide, containing 4-7 densely aggregated ovoid or subglobose spikes 5-9 mm. long, 4.5-8 mm. wide, each with 15-35 ascending perigynia with spreading beaks; bracts inconspicuous; scales ovate, acute, blackish, much exceeded by perigynia; perigynia ovate, very flat, strongly winged, 4.5-5.5 mm. long, 2-2.75 mm. wide, weakly nerved, dark tinged, rounded at base, abruptly contracted into a serrulate bidentulate beak ½ length of body.

Type Locality: Pagosa Peak, Colorado (Baker 232).

Summits of high mountains, Alberta and Oregon south to Colorado, Nevada and California, where there is only one known locality.

Loc.: Mt. Dana, *Bolander* 5074.

Refs.: Carex nubicola Mackenzie, Bull. Torr. Club 36: 480 (1909). *C. Haydeniana* Olney, S. Wats. Bot. King 366 (1871), (not *C. Haydenii* Dewey 1854), type from Uinta Mts., eastern Utah. *C. festiva* Dewey var. *Haydeniana* W. Boott in S. Wats. Bot. Cal. 2: 234 (1880). *C. festiva* Dewey var. *decumbens* Holm, Am. Jour. Sci. (4) 16: 20, 26 (1903), type from Pagosa Peak, Colorado, *Baker* 232. *C. macloviana* D'Urv. var. *Haydeniana* "W. Boott" ex. Kük. in Engler, Pflzr. 4[20]: 196 (1909).

45. C. pachystachya Cham. Cespitose, the culms rather slender, 3-8 dm. high, nearly smooth; leaf-blades 2-4 mm. wide; spikes 4-8, densely aggregated or more or less separate, ovoid or suborbicular, 5-8 mm. long, 4-6 mm. wide, with 10-30 at length spreading perigynia; scales ovate, dark reddish with very narrow hyaline margins; perigynia ovate, 3.5-4 mm. long, 1.5-2.25 mm. wide, olive brown, strongly plano-convex, the walls submembranaceous, nerveless ventrally, rounded at base, contracted into an obliquely cut dark-tipped beak ½ length of body, terete and nearly smooth at apex.

Type Locality: "In Unalaschka," Alaska.

A widely distributed species extending from the high mountains of Colorado and California northward to the Aleutian Islands. In California it is found in the northern counties. Further north it is an abundant species. It has a wide altitudinal range, and individual plants vary very considerably.

Locs.: Mt. Shasta, *Pringle;* Sisson, *Hall & Babcock* 4063; Beebe's Ranch, Humboldt Co., *Tracy* 3390; Medicine Lake, *Goldsmith* 28a; Mt. Eddy, *Heller* 12468; Oro Fino, Siskiyou Co., *Butler* 806; Eureka, *Hitchcock;* Peter Klink's Meadow, Siskiyou Co., *Dudley.*

Refs.: Carex pachystachya Cham. ex Steud. Synop. Cyper. 197 (1855). *C. festiva* Dewey var. *pachystachya* Bailey, Mem. Torr. Club 1: 51 (1889). *C. macloviana* D'Urv. var. *pachystachya* "Bailey" ex. Kük. in Engler, Pflzr. 4^{20}: 197 (1909). *C. olympica* Mackenzie, Bull. Torr. Club 43: 610 (1917).

46. C. abrupta Mackenzie. (Fig. 19). Densely cespitose, the culms 4-6 dm. high, slender, erect, smooth; leaf-blades 1.5-2.5 mm. wide; head suborbicular, 9-16 (or 17) mm. long, and nearly as wide, the 4-8 spikes densely aggregated, ovoid, 5-8 mm. long, 5-6 mm. wide, the 10-20 perigynia ascending; scales ovate, obtuse, chestnut-brown with greener center and at length hyaline margins; perigynia oblong-lanceolate, 3.75-4 mm. long, 1.5 mm. wide, soon brownish tinged, margined to the rounded base, the body serrulate above, abruptly contracted into the slender beak.

Type Locality: West Branch of North Fork of Feather River, near Stirling, Butte Co., California (Heller 10820).

Mountains of Oregon and northern California and extending south throughout the Sierra Nevada in California and in the higher southern mountains.

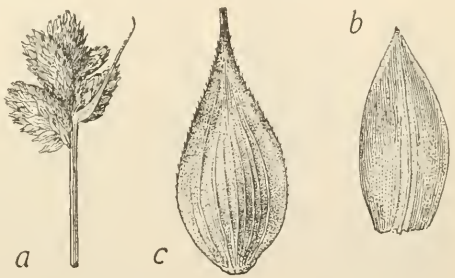

Fig. 19. Carex abrupta Mackenzie.

a, inflorescence, × 1; *b*, scale, × 9; *c*, perigynium, × 9.

Locs.: Samoa, Humboldt Co., *Tracy* 873; Modoc Co., *Manning* 952 (in part); Dinsmore's Ranch, Humboldt Co., *Tracy* 4104½; San Jacinto Peak, *Reed* 2499; Mt. San Gorgonio, *Geo. B. Grant* 6403; Bluff Lake, San Bernardino Mts., *Benton;* Round Valley, San Jacinto Mts., *Hasse;* Bear Valley, *Abrams* 2856, *Parish* 1783; Salmon Creek, Tulare Co., *Hall & Babcock* 5162 (in part); Big Trees, Calaveras Co., *Hillebrand* 2321 (in part); Ebbetts Pass, *Brewer* 2024, 2075; Hot Springs Valley, *Jepson* 4101; Mt. Dana, *Bolander* 5069; Yosemite, *Bolander* 6214; Truckee River, Nevada Co., *Davy;* Stirling, Butte Co., *Heller* 10820; Mt. Tallac, *Abrams* 4848; Chagoopa Creek, Tulare Co., *Dudley* 2268; *Lemmon* 488; Tuolumne Soda Spgs., *Congdon;* Echo Lake, *Brainerd* 193; Strawberry Creek, *Brainerd* 226 (in part); Meisners, El Dorado Co., *Brainerd;* Slippery Ford, *Brainerd* 205 (in part); Poison Meadow, near Big Arroyo, upper Kern River, *Jepson* 1131; Truckee, *Hitchcock* 356 (in part); Yosemite, *Hitchcock;* Stanislaus Forest, Alpine Co., *Eggleston* 9427, 9490; Bloody Cañon, Mono Co., *Ware* 2715c (in part); Strawberry, Tuolumne Co., *A. L. Grant* 109.

Ref.: Carex abrupta Mackenzie. Bull. Torr. Club 43: 618 (1917). "*C. nervina* Bailey," Parish, Bull. S. Cal. Acad. 5: 26 (1906). "*C. festiva stricta* Bailey," Parish, l. c. 53, in part.

47. C. mariposana Bailey. Densely cespitose, the culms 2.5-6 dm. high, slender, smooth; leaf-blades 2-3 mm. wide; head oblong or ovoid, 2-3.5 cm. long, the spikes 4-12, the upper approximate, the lower 1-3 slightly separate, ovoid or oblong-ovoid, 8-12 mm. long, 4.5-7 mm. wide, the 10-20 perigynia closely appressed; scales ovate, acute, reddish with lighter center; perigynia narrowly ovate, 5 mm. long, 1.75 mm. wide, green or in age straw-colored, narrowly winged to the rounded base, serrulate to middle, tapering into slender beak ¼ length of body.

Type Locality: Tuolumne Meadows, California (Jepson 4176).

Sierra Nevada from Shasta Co. to Tulare Co., and in the higher southern mountains.

Locs.: Yosemite, *Brewer* 1641, *Bolander* 4962, 6222; Soda Spgs. of San Joaquin, *Congdon;* Truckee River, Nevada Co., *Davy;* Butte Mt., *Hall* 9792; Yosemite, *Congdon;* Nevada Falls, *Bioletti;* Lake Tenaya, *Hall & Babcock* 3639; Sonora Pass, *A. L. Grant* 266, 277a; Cow Creek, Tuolumne Co., *Jepson* 6515; Kennedys Lake, *A. L. Grant* 478; Kaweah River, Tulare Co., *Dudley* 1920; Chagoopa Creek, Tulare Co., *Dudley* 2281; Hockett Meadow, Tulare Co., *Dudley* 1901; Cone Peak Camp, Tulare Co., *Dudley;* Lake Tahoe, *Kellogg;* Summit Camp, *Kellogg;* Hat Creek, Shasta Co., *Eggleston* 7880; Clark's Ranch, *Torrey* 551 (in part); Little Lake, Slippery Ford, El Dorado Co., *Brainerd* 205 (in part); Strawberry Creek, El Dorado Co., *Brainerd* 226 (in part); Tuolumne Meadows, *Jepson* 4476; Johnson Lake, Crescent Lake and Bridal Veil Trail, Mariposa Co., *Congdon;* North Fork, *Griffiths* 4570; San Antonio Mt., *Hall* 2416, *C. M. Wilder;* Grayback Mt., *C. M. Wilder;* San Gorgonio Mt., *Hall* 7635; Squaw Valley, Placer Co., *L. S. Smith* 558 (in part), 564; Alta Meadow, Tulare Co., *Geo. B. Grant.*

Refs.: Carex mariposana Bailey, Bull. Torr. Club 43: 619 (1917). "*C. Preslii* Steud." Parish, Bull. S. Cal. Acad. 5: 52 (1906). "*C. adusta* Boott," W. Boott in S. Wats. Bot. Cal. 2: 238 (1880), in small part.

48. C. integra Mackenzie. (Fig. 20). Very densely cespitose, the culms 1.5-3.5 dm. high, slender but erect, smooth; leaf-blades 1-2 mm. wide; head 1-2 cm. long, the spikes 4-8, densely aggregated, obovoid or oblong-obovoid, 4-8 mm. long, 3.5-5 mm. wide, the 10-20 perigynia appressed or appressed-ascending; scales ovate, acute or short cuspidate, dark chestnut with prominent midvein and in age hyaline margins; perigynia 2.25-2.75 mm. long, 0.75-1 mm. wide, plano-convex, thickish, nerveless or nearly so ventrally, narrowly margined to the round-tapering base, more or less contracted into the slender beak ½ length of body or more.

Fig. 20. Carex integra Mackenzie.

a, inflorescence, × 1; *b*, scale, × 7; *c*, perigynium, × 7.

Type Locality: Summit, Placer Co., California (Heller 9841).

Sierra Nevada from Tulare Co. to Siskiyou Co., extending north in the Cascade Mts. of Oregon.

Locs.: Yosemite, *Abrams* 4399; upper Kings River, Fresno Co., *Dudley;* Squaw Valley, Placer Co., *L. S. Smith* 556 (in part), 558; Slippery Ford, El Dorado Co., *Brainerd* 216, 205 (in part); Summit, Placer Co., *Heller* 9841; Hat Creek, Shasta Co., *Eggleston* 7380, 7430; Mt. Shasta, *H. E. Brown* 357; Olancha Mt., Tulare Co., *Hall & Babcock* 5249; North Fork, *Griffiths* 4561; Mt. Eddy, Siskiyou Co., *Eggleston* 11655; Stanislaus Forest, Alpine Co., *Eggleston* 9497.

Ref.: Carex integra Mackenzie, Bull. Torr. Club 43: 608 (1917).

49. C. teneræformis Mackenzie. Cespitose, the culms 3-4.5 dm. high, very slender, smooth or nearly so; leaf-blades averaging 1.5 mm. wide; head 1.5-2.5 cm. long, the spikes 5-8, readily distinguishable and more or less separate, 3.5-6 mm. long, 3.5-4.5 mm. wide, the 6-12 perigynia loosely appressed; scales ovate, acute, light brown with lighter midvein and inconspicuous hyaline margins; perigynia 3.25 mm. long, 1.25 mm. wide, plano-convex, thickish, winged to the rounded base, serrulate above, nerveless or nearly so ventrally, tapering into the slender beak 1 mm. long.

Type Locality: Jonesville, Butte Co., California (Hall 9781).

Sierra Nevada from Butte Co. to Tulare Co.; also on Mt. Sanhedrin, Lake Co., and in the Southern California mountains.

Locs.: Yosemite, *Bolander* 6217; Gold Lake, Sierra Co., *Hall & Babcock* 4497; Relief Dam Mt., Tuolumne Co., *A. L. Grant* 370; Strawberry, Tuolumne Co., *Jepson* 6505; Calaveras Big Trees, *Hillebrand* 2305 (in part), *A. L. Grant* 4c; Strawberry Creek, El Dorado Co., *Brainerd* 185, 186; Mrs. Watson's, El Dorado Co., *Brainerd* 184; Jonesville, Butte Co., *Hall* 9781; Eagle Peak, Yosemite, *Jepson* 4374; Nevada Falls, Yosemite, *Bioletti;* Ontario Peak, *Johnston* 1503; Yosemite, *Abrams* 4401; Mt. Sanhedrin, Lake Co., *Heller* 5959; Kaweah River, *Dudley* 1410, 1411, 1423; upper Kern River, *Dudley* 864; Hockett Meadow, *Dudley* 1900; Sequoia Grove, Calaveras Co., *Dudley;* San Antonio Mts., *Swan & Chase, Johnston* 1393, 1399, 1503; Hunters Meadow, Fresno Co., *Dudley* 3261.

Ref.: Carex teneræformis Mackenzie, Bull. Torr. Club 43: 609 (1917).

50. C. amplectens Mackenzie. (Fig. 21). Cespitose, the culms stiff, 5-8 dm. high; leaf-blades 2.5-4 mm. wide; head 2.5-3.5 (or 5) cm. long, the 6-12 spikes approximate or lower slightly separate, ovoid, or oblong-ovoid, 7-15 mm. long, 4-5 mm. wide, short-clavate and sparingly staminate at base, the 8-15 perigynia closely appressed; scales ovate, acute or short-cuspidate, greenish and slightly tawny tinged, the midvein prominent; perigynia ovate, 3.5-4 mm. long, 1.75 mm. wide, light green, rounded at base, narrowly margined and strongly serrulate, several nerved on both faces, contracted into beak ½ length of body or less.

Type Locality: Lover's Leap, El Dorado Co., California (Brainerd 209).

Sierra Nevada from Shasta Co. to Tulare Co.

Locs.: Yosemite, *Bioletti*, *Jepson* 4265*a*, 4388 (in part), *Dudley;* Kaweah River, Tulare Co., *Dudley* 1446; Soda Creek, Tulare Co., *Dudley* 1949; Lovers Leap, El Dorado Co., *Brainerd* 209; Big Tree Grove, *Bolander* 4978; Hat Creek, Shasta Co., *Eggleston* 7493; Stanislaus Forest, Calaveras Co., *Eggleston* 9486.

Ref.: Carex amplectens Mackenzie, Bull. Torr. Club 43: 611 (1917).

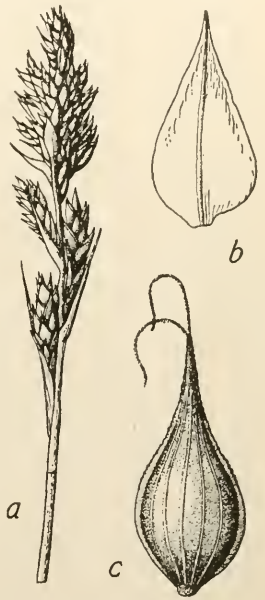

Fig. 21. Carex amplectens Mackenzie.
a, inflorescence, × 1; *b*, scale, × 9; *c*, perigynium, × 9.

51. C. Harfordii Mackenzie. Cespitose, the culms 2.5-8 dm. high, erect, stiff, smooth; leaf blades 2.5-4.5 mm. wide; head 1.5-2.5 cm. long, globose to oblong-ovoid, the 10-20 spikes closely aggregated, ovoid, 6-10 mm. long, 4-6 mm. wide, the perigynia 10-30, appressed-ascending or in age spreading; lower one or more bracts conspicuous; scales ovate, acute, or short-cuspidate, reddish-brown with light sharp midvein and very narrow hyaline margins; perigynia narrowly ovate, 3.5-4.25 mm. long, 1.5 mm. wide, plano-convex, thick, finely nerved dorsally, several nerved ventrally, round-tapering to a substipitate base, narrowly margined (serrulate above) from base, tapering into a beak ¼ length of body.

Type Locality: "California" (Kellogg & Harford 1073).

Coastal counties from Humboldt Bay to Monterey Co. Distinguished from the other coastal species, Carex subbracteata and C. gracilior, by the sharper-pointed scales with sharply defined midvein and by the tapering perigynia being strongly nerved ventrally.

Locs.: Fort Point, San Francisco, *Bolander* 1568*a*; Monterey, *Brewer* 697; South Cahill Ridge, San Mateo Co., *Dudley;* Petaluma, Sonoma Co., *Congdon* 364; San Francisco, *Congdon;* Pacific Grove, Monterey Co., *Heller* 6786; *Kellogg & Harford* 1073; Punta de Los Reyes, *Bigelow*, *Vasey* in 1875; Humboldt Bay, *Chandler* 1115.

Refs.: Carex Harfordii Mackenzie, Bull. Torr. Club 43: 615 (1917). *C. festiva* Dewey var. *stricta* Bailey, Mem. Torr. Club 1: 51 (1889) at least in part, type from California.

52. C. sub-bracteata Mackenzie. Cespitose, the rootstocks short creeping, the culms 3.5-12 dm. high, robust, obtusely triangular, smooth; leaf-blades 2.5-4 mm. wide; head 1.5-2.5 cm. long, globose or ovoid, the spikes 5-10, closely aggregated, ovoid, 6-10 mm. long, 4-6 mm. wide, the perigynia 10-20, appressed or in age appressed-ascending; one or more lower bracts conspicuous; scales ovate, obtuse or acutish, reddish-brown with lighter center and hyaline margins; perigynia narrowly ovate, 3.5-4.5 mm. long, 1.5 mm. wide, thick plano-convex, few nerved dorsally, nerveless or nearly so ventrally, round-tapering at base, narrowly margined (serrulate above) from base, contracted into a beak ⅓ length of body.

Type Locality: Oakland (Bolander).

Coast Ranges from Santa Barbara Co. to Humboldt Co.

Locs.: Russian River, Sonoma Co., *Bolander* 3868 (in part); Mendocino City, *Bolander* 4771; Crystal Spgs. Lake, San Mateo Co., *Elmer* 4429; Barrack and Lake Merced, San Francisco Co., *Dudley;* Coal Mine Ridge, Cahill Ridge and Crystal Spgs., San Mateo Co., *Dudley;* Lake San Andreas, San Mateo Co., *Davy* 763; Peters Creek, Santa Cruz Co., *Dudley;* Sherwood Valley, Mendocino Co., *Dudley;* Oakland, *Bolander* 6200 (in part), 6203, *Abrams* 6448; Humboldt Bay, *Hall & Chandler* 1115; Comptche, Mendocino Co., *McMurphy* 431, *Kellogg & Harford* 1065; Monterey, *Parry;* Santa Cruz, *Wood;* San Francisco, *Jones;* Santa Barbara, *Elmer* 3756; Laguna, *Schoenefeldt* 3591; Fort Point, San Francisco, *Bolander* 1568 (in part); Lake San Andreas, San Mateo Co., *Bioletti* 3; Eel River, Humboldt Co., *Tracy* 4695.

Ref.: Carex sub-bracteata Mackenzie, Bull. Torr. Club 43: 612 (1917).

53. C. gracilior Mackenzie. Cespitose from slender short creeping black fibrillose rootstocks; culms 1-6 dm. high, slender, smooth or nearly so on the angles; leaves on lower third of culm, but not bunched, the blades 1-2 mm. wide, 0.5-2 dm. long; head 12-20 mm. long, narrow or oblong, the spikes 3-6, aggregated or lower 1-2 more or less separate, suborbicular, 5-8 mm. long, 4-6 mm. wide, the 4-12 perigynia ascending or spreading-ascending with conspicuous beaks; scales ovate, obtuse or acutish, chestnut-brown with lighter midvein and narrow hyaline margins; perigynia narrowly ovate, 3.5-4.5 mm. long, 1.5 mm. wide, thick, plano-convex, several nerved dorsally, nerveless or nearly so ventrally, round tapering at base, narrowly winged (serrulate above) from base, contracted into a beak ⅓ length of body.

Type Locality: Cloverdale, Sonoma Co., California (Bolander 3822).

Coast Ranges from San Mateo Co. to Mendocino Co.

Locs.: Petaluma, *Bolander* 4635; Mark West Creek, Sonoma Co., *Bolander* 3814; *Bigelow* 19; Berkeley, *Harriet Walker* 18; Cloverdale, Sonoma Co., *Bolander* 3822, 3822*a*; Mendocino Co., *Bolander* 4635; Seal Cove, San Mateo Co., *Dudley;* Sonoma, *R. Kuhn, Bolander, Keller* in 1872; Russian River, Sonoma Co., *Bolander* 3867, 3868 (in part); Santa Rosa, *Wooton.*

Refs.: Carex gracilior Mackenzie, Bull. Torr. Club 43: 614 (1917). "*Carex propinqua* Nees & Meyen" Boott, Pac. R. Rep. 4: 154 (1857); erroneously given as Boott in Ill. Car. in Bot. Cal. 2: 234 (1880). "*C. festiva* Dewey var. *gracilis* Olney" W. Boott in S. Wats. Bot. Cal. 2: 234 (1880), in part.

54. C. pachycarpa Mackenzie. Culms 3-6 dm. high, obtusely triangular, smooth; leaf-blades 2.5-4 mm. wide; head 1.5-2.5 cm. long, globose or short ovoid, the spikes 5-8, closely aggregated, ovoid, 6-10 mm. long, 6-9 mm. wide, the 10-20 perigynia appressed; scales ovate, acute, light reddish-brown with sharply defined midvein and hyaline margins; perigynia ovate, plano-convex, thick, 5 mm. long, 2 mm. wide, many striate dorsally, faintly many striate ventrally, round tapering at base, narrowly margined (serrulate above) from base, the beak ½ length of body.

Type Locality: Big Tree Road, Silver Valley, California (Brewer 1977).

Mountains of Oregon and northern California, extending south in the Sierra Nevada to Tulare Co.

Locs.: Silver Valley, *Brewer* 1977; Lassen Peak, *Brewer* 2178; Big Trees, *Hillebrand* 2310, 2316; Summit Camp, Sierra Nevada, *Kellogg;* trail to Snowy Cascade, *Brainerd;* Mt. Lyell, *McLean;* Mt. Goddard, *Hall & Chandler* 693; n. e. Modoc Co., *Manning* 952 (in part); Alta Meadows, Tulare Co., *Geo. B. Grant;* Kennedys Lake, *A. L. Grant* 549; Mt. Shasta, *Brewer* 1375, 1398, *Canby* 313; Echo Lake, *Brainerd* 197; Meisners Lake, *Brainerd* 198; Dinsmores Ranch, Humboldt Co., *Tracy* 4145; Prattville, *M. E. Jones;* Truckee, *Hitchcock* 326; Bear Creek, Tulare Co., *Dudley* 2923.

Refs.: Carex pachycarpa Mackenzie, Bull. Torr. Club 43: 616 (1917). *C. adusta* Boott var. *congesta* W. Boott in S. Wats. Bot. Cal. 2: 238 (1880), type *Brewer* 1977 from Silver Valley. *C. Liddoni* Boott var. *incerta* Bailey, Bot. Gaz. 13: 88 (1888), same type, i. e., *Brewer* 1977.

55. C. paucifructus Mackenzie. Densely cespitose, the culms 1-2.5 dm. high, erect, stiff, smooth, sharply triangular; leaves bunched above the base, the blades 1.5-3 mm. wide, 3-7 cm. long; head 1-2 cm. long, ovoid or oblong, the spikes 4-8, aggregated, ovoid, tapering at base, 6-9 mm. long, 4.5 mm. wide, the perigynia 6-12, appressed or appressed-ascending; scales ovate, chestnut with lighter midvein and conspicuous hyaline margins; perigynia ovate, thick, strongly plano-convex, 4 mm. long, 1.5 mm. wide, nerveless ventrally, finely many-nerved dorsally, margined to the round tapering base, serrulate above, tapering into the beak ⅓ length of body.

Type Locality: Devils Basin, El Dorado Co., California (Brainerd 200). Sierra Nevada, known only from Sierra and El Dorado Cos.

Locs.: Devils Basin, El Dorado Co., *Brainerd* 200; Webber Lake, Sierra Co., *Kennedy & Doten* 70; Sierra Nevada, *Brandegee;* Tallac, El Dorado Co., *Dudley.*

Ref.: Carex paucifructus Mackenzie, Bull. Torr. Club 43: 615 (1917).

XIII. Canescentes Fries. Cespitose, but in some species with slender stolons. Culms triangular. Sheaths not cross-rugulose. Spikes 1-10, with few to many perigynia, simple, the terminal gynæcandrous, the lateral pistillate or gynæcandrous, or rarely all androgynous. Bracts inconspicuous. Perigynia plano- or biconvex, white puncticulate, lanceolate, ovoid, oval or obovoid, appressed to spreading, beakless to prominently beaked, more or less nerved on both sides, not winged or margined, but acute-angled above, nearly or entirely filled by the lenticular achene. Style jointed with achene, deciduous, slender, its base not enlarged. Stigmas 2.

56. C. disperma Dewey. In large clumps, the rootstocks sending out long slender stolons; culms very weak, 1.5-6 dm. high, rough above, exceeding leaves; leaf-blades 1-1.5 mm. wide, flat, flaccid, deep green; spikes distant or upper aggregated in a terminal inflorescence 1.5-2.5 cm. long, with 1-5 ascending perigynia and 1-2 staminate flowers; bracts wanting or lower slightly developed; scales shorter than perigynia, ovate-triangular, sharp pointed, hyaline with green midvein; perigynia ovoid-elliptic, 2 mm. long, 1.5 mm. wide, flattened suborbicular in cross-section, smooth, light green, not margined, finely nerved, rounded and slightly stipitate at base, rounded and abruptly beaked at apex, the minute beak smooth, 0.25 mm. long, hyaline at orifice.

Type Locality: Massachusetts (Dewey).

Boggy woods, Newfoundland to Alaska, south to New Jersey, Indiana, New Mexico and California; also northern Eurasia. In California it has been collected only at a few stations in the southern Sierra Nevada.

Locs.: Bishop Creek, Inyo Co., *Davidson* 2545; Walker Lake, Mono Co., *Congdon; Lemmon* 489, no data (probably Butterfly Valley); Kern River, Tulare Co., *Coville & Funston* 1697.

Refs.: Carex disperma Dewey, Am. Jour. Sci. 8: 266 (1824). *C. tenella* Schk., Riedgr. 1: 23, pl. Pp. f. 104 (1801), not Thuill. 1799 (Schkuhr guessed the type came from Saxony); W. Boott in S. Wats. Bot. Cal. 2: 235 (1880); Kük. in Engler, Pflzr. 4[20]: 223 (1909). *C. Blyttii* Nylander, Spicil. Pl. Fenn. 2: 35 (1846), type from Finland.

57. C. canescens L. (Fig. 22). Cespitose, in large clumps, the culms erect, slender, 2.5-8 dm. high, roughened immediately beneath head, mostly exceeding the leaves; leaf-blades glaucous, flat, 2-4 mm. wide; spikes 4-9, the lower remote (sometimes but little), 3-12 mm. long, 3-5 mm. wide; lowest bract more or less developed; scales shorter than perigynia, ovate, sharp pointed, hyaline with green keel; perigynia appressed-ascending, 1.8-2.8 mm. long, 1-1.8 mm. wide, membranaceous, pale green, white puncticulate, faintly few nerved, rounded, short-stipitate and spongy at base, minutely beaked, the beak with margins minutely serrulate and orifice emarginate or entire; achene filling perigynium.

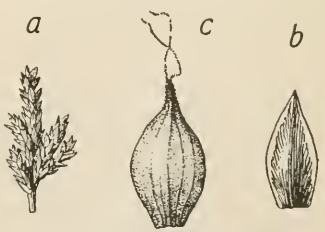

Fig. 22. Carex canescens L., *a*, inflorescence, × 1; *b*, scale, × 8; *c*, perigynium, × 8.

Type Locality: "Habitat in Europa septentrionali."

Swamps and bogs, Labrador to Alaska south to Virginia and California; also Eurasia, South America and Australia. In California it is confined to the higher Sierra Nevada, where it is known from Tulare Co. north to Placer Co. (The illustration represents var. dubia Bailey.)

Locs.: Ebbetts Pass, *Brewer* 2063; Walker Lake, Mono Co., *Congdon;* Glen Alpine Spgs., El Dorado Co., *L. M. Lathrop;* Mineral King, *Coville & Funston* 1506; Squaw Valley, Placer Co., *L. S. Smith* 558*a*, 560.

Refs.: Carex canescens L. Sp. Pl. 2: 974 (1753); W. Boott in S. Wats. Bot. Cal. 2: 236 (1880); Kük. in Engler, Pflzr. 4[20]: 216 (1909). *C. curta* Good. Trans. Linn. Soc. 2: 145 (1794), type from Prussia. *C. canescens* L. var. *robustior* Blytt ex Anderss. Cyp. Scand. 57 (1849), type from Scandinavia. "*C. lagopina* Wahl." W. Boott in S. Wats. Bot. Cal. 2: 233 (1880). *C. canescens* L. var. *dubia* Bailey, Bot. Gaz. 9: 119 (1884), type from Bear River Cañon, Utah.

58. C. arcta Boott. Cespitose, the culms slender, erect, 1.5-8 dm. high, very rough above, usually strongly exceeded by the leaves; leaf-blades 2-4 mm. wide, flat, glaucous or light green; spikes 5-15, 5-10 mm. long, 4-6 mm. wide, many-flowered, aggregated into a head 1.5-3 cm. long, 7-12 mm. wide; lower one or two bracts developed; scales shorter than perigynia, ovate, obtusish to short-cuspidate, hyaline with green midvein, more or less brownish tinged; perigynia ascending or somewhat spreading, ovate, 2-3 mm. long, nearly 1.25 mm. wide, sharp edged but not winged, many-nerved dorsally, lightly nerved at base ventrally, white puncticulate, rounded and short-stipitate at base, tapering into the strongly serrulate, shallowly bidentate beak, obliquely cut and fissured on the dorsal side.

Type Locality: "In America boreali, Canada, Lake Superior, Rainy Lake, Lake of the Woods."

Swamps and wet woods, New Brunswick to British Columbia, south to New York, Montana and California, where it is known only from the northwestern portion near the coast.

Loc.: Eureka, Humboldt Co., *Tracy* 1195, 3806.

Refs.: Carex arcta Boott, Ill. Car. 4: 155, pl. 497 (1867); Kük. in Engler, Pflzr. 4[20]: 228 (1909). *C. canescens* L. var. *polystachya* Boott in Richards, Arct. Exped. 2: 344 (1852), same type. *C. Kunzei* Olney, Proc. Am. Acad. 8: 406 (1872), name only, type from Oregon, *Hall* 574; excluding reference to Kunze's plate. *C. canescens* L. var. *oregana* Bailey, Mem. Torr. Club 1: 75 (1889), type from Portland, Oregon, *Henderson*.

XIV. Polytrichoideæ Tuckerm. Densely tufted. Culms slender. Leaf-blades narrow. Spike solitary, linear, androgynous, bractless. Rachis straight, not dilated. Perigynia appressed, membranaceous, the upper part empty, oblong-elliptic, many-nerved, not 2-ribbed, compressed-triangular, beakless. Achenes triangular, the sides concave. Style slender, flexuous, its base not enlarged, jointed with achene, deciduous. Stigmas 3, short.

59. C. leptalea Wahl. Cespitose with slender rootstocks; culms very slender, 2-6 dm. high, obscurely triangular, smooth or slightly roughened, mostly exceeding leaves; leaf-blades 0.5-1.25 mm. wide, flat or channeled; spike 4-15 mm. long, 2-3 mm. wide, the staminate part varying from inconspicuous to occupying nearly whole spike; pistillate scales except lowest ovate, very obtuse to short pointed, ½ length of perigynia, reddish-brown tinged with hyaline margins and green center; perigynia 1-10, 2.5-4.25 mm. long, 1-1.5 mm. wide, oval-elliptic, more or less strongly overlapping, round or somewhat flattened in cross-section, not concealed by the scales, finely many-striate, substipitate at base and rounded at apex.

Type Locality: "Habitat in Pennsylvania."

Bogs and wet meadows, very widely distributed from Labrador to Alaska, south to Florida, Texas, Colorado and northern California, where known only from the northwestern part near the coast.

Loc.: Patricks Point, Humboldt Co., *Tracy* 4365.

Refs.: Carex leptalea Wahl. Vet. Acad. Handl. Stockholm 139 (1803); Kük. in Engler, Pflzr. 4[20]: 89 (1909). *C. microstachya* Michx. Fl. Bor. Am. 2: 169 (1803) [not Ehrh. 1788], type not given, presumably from eastern North America. *C. polytrichoides* Muhl. in Willd. Sp. Pl. 4: 213 (1805), type from Pennsylvania; W. Boott in S. Wats. Bot. Cal. 2: 229 (1880), (note).

XV. Firmiculmes Kük. Culms wiry, triangular, aphyllopodic, the leaf-blades often rudimentary at flowering time. Spike one, androgynous, the staminate part in age short-peduncled, the pistillate loosely few-flowered. Bracts absent. Scales more or less chartaceous. Perigynia 1 to several, obtusely triangular, smooth, 2-keeled, but otherwise nerveless, tapering at the base, very minutely beaked, the orifice truncate. Achenes triangular with nearly flat sides, closely enveloped by the perigynia, apiculate-tipped, constricted at base. Style slender, slightly enlarged upward, jointed with achene, early deciduous. Stigmas 3, elongated.

60. C. multicaulis Bailey. (Fig. 23). Rootstocks lignescent; culms 2-4 dm. high, deep green, smooth, obtusely triangular; leaves with well developed blades 1-2 to a culm, the blades 1.5 mm. wide, very rough above, flat or somewhat involute; inflorescence consisting of a terminal staminate part and of 2 to several perigynia, in the axils of long (the lower) or short (the upper) awned scales, these enlarged and white hyaline at base; terminal staminate part, 7-25 mm. long, 1.5-2 mm. wide, with very obtuse broadly white hyaline margined scales; perigynia oblong-obovoid, 5-7 mm. long, the sides 2.5 mm. wide, pale green, finely and obscurely nerved, tapering to the stipitate base, abruptly beaked, the beak minute, entire or nearly so, minutely denticulate.

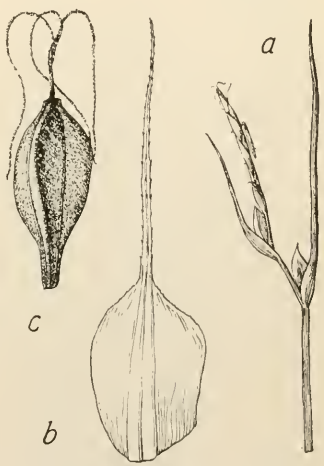

Fig. 23. Carex multicaulis Bailey. *a*, inflorescence, × 1; *b*, scale, × 4; *c*, perigynium, × 4.

Type Locality: Yosemite Valley, California (Torrey 544).

Dry soil from southern Oregon through northern and middle California and along the Sierra Nevada to southern California.

Locs.: San Bernardino Co., *Parish* 1057, 2473, 3269, 3704, 5030; Cuyamaca, *Brandegee;* Mt. Wilson, *Geo. B. Grant* 138, *Geo. B. Grant & Wheeler* 6223; Monterey Co., *Davy* 7657, *Elmer* 3135; Mariposa Co., *Congdon;* Yosemite Valley, *Torrey* 544, *Abrams* 4466, *Brewer* 1635, *Dudley, Bioletti;* Napa Co., *Tracy* 1616; Ukiah, *Bolander* 3906; Rattlesnake Mt., *Davy* 5324; Siskiyou Co., *Butler* 853, 856; Sissons, *H. E. Brown* 368; Rush Creek, Trinity Co., *Yates* 533; Van Duzen, Trinity Co., *Tracy* 2792; Sierra Valley, *Lemmon;* Sequoia Grove, Tulare Co., *Dudley* 642; Stirling, Butte Co., *Heller* 10794; Strawberry Creek, El Dorado Co., *Brainerd;* Castella, Shasta Co., *Piper* 6429, 6468, 6467; Mt. Shasta, *H. E. Brown* 319 (in part), *Copeland* 3780; North Fork, *Griffiths* 4554; Emigrant Gap, *M. E. Jones* 3286; Laguna, *Schoenefeldt* 3605; Susanville, *M. E. Jones;* Quincy, *R. M. Austin* 1004; Dunlap, *Griffiths* 4679; Sierra Nevada, *Lemmon;* Big Trees, Calaveras Co., *Brewer* 2306; Red Mt., Mendocino Co., *Bolander* 6478 (in part); Big Tree Cañon, Tulare Co., *Coville & Funston* 1366; Yuba Co., *Wood* 759; Clinton, Amador Co., *Hansen* 1445; Southern California, *Parry & Lemmon* 395; Sierra Nevada foothills, *Bigelow;* Mt. Lowe, *McClatchie*; Los Angeles Co., *Abrams* 1885; San Antonio Mts., *Johnston* 1738, 1426, 27*g*; Upton, Siskiyou Co., *Jepson* 52*a*; Mariposa Big Trees, *Dudley;* Eight Mile, Yosemite to Wawona, *Jepson* 4293.

Refs.: Carex multicaulis Bailey, Bot. Gaz. 9: 118 (1884); Parish, Bull. S. Cal. Acad. 4: 114 (1880); Kük. in Engler, Pflzr. 4[20]: 93 (1909). "*C. Geyeri* Boott" Boott Ill. Car. 1: 42 pl. 105 (1858), in part; W. Boott in S. Wats. Bot. Cal. 2: 229 (1880). "*Carex phyllostachys* Meyer" Dewey in Bot. Mex. Bound. 231 (1858).

61. C. Geyeri Boott. Rootstocks thick, lignescent, elongated; culms up to 3.5 dm. high, sharply triangular, very rough on the margins; leaves with well-developed blades usually 2 to a culm, the blades erect, thick, flat, 2-3.5 mm. wide, very rough on the margins, developing after flowering; inflorescence of a terminal

staminate part 5-10 mm. long, and 1.5-3 mm. wide with oblong-ovate striate obtusish straw-colored scales, and 2 or 3 perigynia, the lower in the axils of short-awned scales, the upper in the axils of obtusish or acutish scales, which are straw-colored with hyaline margins and largely conceal the perigynia; perigynia appressed-ascending, oblong, triangular, 6 mm. long, straw-colored, smooth, shining, the sides 2.5 mm. wide, 2-keeled but otherwise nerveless, tapering to the short-stipitate base, rounded at apex and abruptly minutely beaked, the beak entire or nearly so, minutely denticulate around the base.

Fig. 24. Carex exserta Mackenzie. *a*, habit, × 2/3; *b*, scale, × 4; *c*, perigynium, × 4.

Type Locality: Rocky Mts., North America (Geyer 332).

Dry mountain sides and open woods, Alberta and Colorado to Washington and northern California.

Loc.: Mt. Eddy, Siskiyou Co., *Eggleston* 11620.

Ref.: Carex Geyeri Boott, Trans. Linn. Soc. 20: 118 (1846).

XVI. Filifoliæ Tuckerm. Densely cespitose. Leaf-blades filiform or narrow. Spike solitary, linear or linear-oblong, androgynous, densely flowered, bractless. Perigynia more or less triangular, nerveless except for the 2 lateral ribs, submembranaceous, not stipitate, not inflated, puberulent or pubescent, beaked or nearly beakless, hyaline tipped and obliquely cut at apex. Achenes triangular, apiculate. Style slender, very short, jointed with achene, at length deciduous. Stigmas 3.

62. C. exserta Mackenzie. (Fig. 24). Densely cespitose, the culms very slender and wiry, 5-25 cm. high, obtusely triangular, smooth, the basal sheaths filamentose; leaf-blades acicular, 0.25-0.5 mm. wide; spike 7-15 mm. long, the terminal staminate part more than half the whole, the pistillate part up to 6 mm. wide with 2-12 ascending perigynia, the pistillate scales orbicular-ovate, obtuse, dull reddish brown with hyaline margins; perigynia obovoid, 2-5 mm. long, rounded at base and apex, essentially beakless, papillose-puberulent, hyaline and obliquely cut at mouth; style black, exserted; rhacheola conspicuous.

Type Locality: Echo Lake, El Dorado Co., California (Brainerd 111).

Dry places at elevations between 5000 and 11,600 feet in the Sierra Nevada from El Dorado Co. to Tulare Co., and in the San Bernardino Mts.; also in southern

Oregon. Forms a large part of the "shorthair meadows" in the Sierra Nevada and is said to be readily eaten by stock.

Locs.: Echo Lake, El Dorado Co., *Brainerd* 111; Yosemite, *Dudley*, *Jepson* 4493, *Abrams* 4600; Little Yosemite, *Jepson* 4396; Tuolumne Soda Spgs., *Brewer* 1697; Mono Pass, *Brewer* 1733; Black Mt., Fresno Co., *Hall & Chandler* 616; Ebbetts Pass, *Brewer* 2029; Big Trees, *Hillebrand* 2318; Mt. Lyell, *Hall & Babcock* 3581; Harrison Pass, *Jepson* 5035; Kings River, *Lemmon;* Mineral King, *Coville & Funston* 1505; Bear Valley, San Bernardino Mts., *Parish* 1784; Bierstadt Peak, *Davy* 3208, 3214, 3219; Kaweah Meadow, *Dudley* 935*a*, 2214; Kettle Mt., Fresno Co., *Dudley;* Grant National Park, *Dudley* 1858; Mountain Lake, Tulare Co., *Dudley* 935; Emigrant Gap, *M. E. Jones* 2908; White Mts., *Jepson* 7365; Stanislaus Forest, Tuolumne Co., *Eggleston* 9323; Dana Fork, Tuolumne River, *Jepson* 3258; Tallac, El Dorado Co., *Dudley;* Truckee, Placer Co., *Dudley.*

Refs.: Carex exserta Mackenzie, Bull. Torr. Club 42: 620 (1915). *C. filifolia* Nutt. var. *erostrata* Kük. in Engler, Pflzr. 4[20]: 86 (1909), same type. "*C. filifolia* Nutt." W. Boott in S. Wats. Bot. Cal. 2: 229 (1880), Parish in Bull. S. Cal. Acad. 4: 114 (1905).

XVII. Scirpinæ Tuckerm. Rootstocks creeping. Culms leafy below. Leaf-blades narrow. Spikes usually 1, linear, staminate or pistillate, many-flowered, occasionally with an additional spike, and normally with an empty scarcely sheathing squamiform bract a short distance below the spike. Perigynia triangular or flattened-triangular, membranaceous, 2-keeled, pubescent or puberulent, tapering at the base, constricted at the apex into the short cylindric entire or bidentulate beak. Achenes triangular with flat sides, sessile, apiculate. Style slender, straight, obscurely jointed with achene, but less indurated in texture and at length deciduous. Stigmas 3, short.

63. C. gigas Mackenzie. Rootstocks densely matted, stout, the culms phyllopodic, 3-4.5 dm. high, roughened above, reddened and somewhat filamentose at base; leaves 5-10, the blades flat, 2.5 mm. wide; staminate spike not seen; pistillate spike 1.5-2.5 cm. long, 4-6 mm. wide, with a scale-like bract at base and 1-3 cm. below a short-sheathing elongated bract, often with a smaller peduncled spike in its axil; scales oblong-ovate, glabrous, brownish with lighter midvein and hyaline margin, covering perigynia; perigynia numerous, black, 3 mm. long, 2 mm. wide, the body oval, flattish, rounded at base and apex, minutely puberulent above and pubescent on the angles, abruptly beaked, the beak 0.5 mm. long, bidentate.

Known only from Siskiyou Co., California.

Locs.: Siskiyou Co., 8000 feet, *Pringle* Aug. 18, 1881 (type); Grizzly Hill, Siskiyou Co., 6800 feet, *Leiberg* 5104, July 12, 1900.

Refs.: Carex gigas Mackenzie, Bull. Torr. Club 35: 268 (1908). *C. scirpoidea* Michx. var. *gigas* Holm, Am. Jour. Sci. (4) 18: 20, f. 8 (1904); Kük. in Engler, Pflzr. 4[20]: 81 (1909).

XVIII. Montanæ Fries. Culms slender, leafy at the base. Leaf-blades narrow, rough above. Terminal spike linear, normally staminate. Lateral spikes 1-5, small, pistillate or sometimes androgynous, subglobose to oblong, closely few to many-flowered, approximate and sessile or short-peduncled, or in some species radical and long-peduncled. Lowest bract squamiform or leaflet-like, sheathless or sub-sheathing. Scales often reddish-brown tinged, acute to cuspidate. Perigynia membranaceous, ascending, the body pubescent at least at base of beak, obovoid to elliptic, triangular or round-triangular in cross-section, 2-keeled, strongly stipitate at base, abruptly contracted into a cylindric emarginate to deeply bidentate hyaline-tipped beak. Achenes normally triangular, the sides convex, closely enveloped, short apiculate. Style short, thickish, jointed with achene, deciduous. Stigmas normally 3, long.

64. C. inops Bailey. (Fig. 25). Cespitose and strongly stoloniferous, the culms 2-3.5 dm. high, very slender, roughened above, reddened and fibrillose at base; leaves clustered toward base, the blades 1.5-2.5 mm. wide, very rough above; staminate spike 1.5-2.5 cm. long, sessile or short-peduncled, the reddish or purplish-brown scales with conspicuous white hyaline margins; pistillate spikes 1-3, approximate or more or less separate, erect, sessile or short-peduncled, oblong or short-oblong, 7-12 mm. long, 4-5 mm. wide, with 4-10 ascending perigynia; lowest bract leaflet-like, more or less reddish tinged at base; scales ovate, sharp-pointed, chestnut or purplish-brown with conspicuous white hyaline margins; perigynia 3.5 mm. long, 2 mm. wide, nearly orbicular in cross-section, strongly stipitate, abruptly beaked, the beak 0.75-1.5 mm. long, deeply bidentate, the teeth strongly hyaline in age.

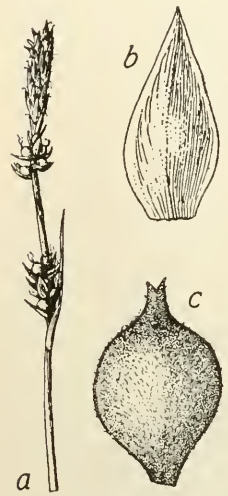

Fig. 25. Carex inops Bailey.
a, inflorescence, × 1; *b*, scale, × 8; *c*, perigynium, × 8.

Type Locality: Mt. Hood, Oregon (Henderson).

Dry soil, chiefly in the Cascade Mts. of Washington and Oregon, extending south into extreme northern California, where recently collected once.

Loc.: Pilgrim Creek, ne. of Mt. Shasta, Siskiyou Co., *Goldsmith* 2.

Refs.: Carex inops Bailey, Proc. Am. Acad. 22: 126 (1886); Kük. in Engler, Pflzr. 4^{20}: 454 (1909). *C. verecunda* Holm, Am. Jour. Sci. (4) 16: 461 (1903), same type. (*C. inops* Kunze, Suppl. Riedgr. 131 is merely mentioned incidentally. I am therefore retaining Bailey's name for the present species.)

65. C. globosa Boott. Stoloniferous, the rootstocks slender, elongate, the culms 15-35 cm. high, slender, roughened above; leaf-blades 1.5-2.5 mm. wide, strongly roughened; staminate spike short-peduncled, 1-2 cm. long, many-flowered; pistillate spikes 2-3 (with additional basal ones on long capillary peduncles), approximate, sessile or short-peduncled, 5-10 mm. long, 4-8 mm. wide with 4-10 ascending perigynia; lower bract leaflet-like, shorter than to exceeding inflorescence; perigynia 5 mm. long, the globose body 2.25 mm. wide, abruptly narrowed to a prominent stipitate base and abruptly beaked, the beak 0.75-1.25 mm. long, strongly bidentate.

Type Locality: California (Nuttall).

Coastal counties of California from San Diego Co. northward to Sonoma Co.; Santa Barbara Islands.

Locs.: Santa Barbara, *Brewer* 302, 303; Mt. Diablo, *Brewer* 1150; Little Sur River, Monterey Co., *Davy* 7317, 7366; Sonoma Co., *Congdon* 84; Oakland, *Bolander* 20, 2295, *Brewer;* Mt. Tamalpais, *Heller* 5716; Santa Cruz Isl., *Brandegee;* San Diego, *Brandegee;* Glenwood, Santa Cruz Co., *Dudley;* Hollow Tree Camp, Santa Cruz Co., *Dudley;* Tassajara, Monterey Co., *Dudley;* Santa Lucia Mts., *Davy* 7724; Redwoods, Marin Co., *Bolander.*

Refs.: Carex globosa Boott, Proc. Linn. Soc. 1: 259 (1845); Parish, Bull. S. Cal. Acad. 4: 112 (1905). *C. umbellata* Schk. var. *globosa* Kük. in Engler, Pflzr. 4^{20}: 453 (1909).

66. C. Brainerdii Mackenzie. (Fig. 26). Rootstocks slender, elongate, the culms from very short to 15 cm. high, slender, very rough on the sharp angles; leaf-blades 1.5-3 mm. wide, much roughened; staminate spike sessile or short-peduncled, 5-8 (or 10) mm. long, few-flowered; pistillate spikes 4-6, 1-4-flowered, the upper 2 or 3 approximate, sessile or short-peduncled, the others basal on erect peduncles; lower bract of upper spikes exceeding inflorescence, chestnut-tinged, more or less strongly sheathing; perigynia 4.5 mm. long, the oval body 1.75 mm. wide,

strongly stipitate, abruptly contracted into the serrulate, hyaline-tippedbidentate beak, 1 mm. long.

Type Locality: Slippery Ford, El Dorado Co., California (Brainerd 121).

Sierra Nevada from Yosemite north to Siskiyou Co.; also in southern Oregon.

Locs.: Slippery Ford, El Dorado Co., *Brainerd* 121; Yosemite, *Bolander* 6196; 20 miles n. of Bartles, Siskiyou Co., *Goldsmith* 10; Lassen Peak, *M. E. Jones;* Sissons, *Brown* 370.

Ref.: Carex Brainerdii Mackenzie, Bull. Torr. Club 40: 534 (1913).

67. C. brevipes W. Boott. In dense clumps from stout matted rootstocks, the culms from very short to 18 cm. high, slender, roughened above; leaf-blades 1.5-2.5 mm. wide, roughened towards apex; staminate spike short-peduncled or sessile, 4-12 mm. long, 2.5 mm. wide, several to many-flowered; pistillate spikes 3-5, usually 10-20-flowered, the upper 1-2 approximate, sessile to strongly peduncled, the others basal, long-peduncled; scales ovate, more or less strongly purplish-tinged; perigynia with obscurely triangular body, little longer than wide, stipitate, abruptly beaked, the beak minutely serrulate.

Type Locality: "Rocky Mts., California" (Kellogg).

From Washington south to California, where found in the Sierra Nevada as far south as Tulare Co., and very locally in the southern mountains.

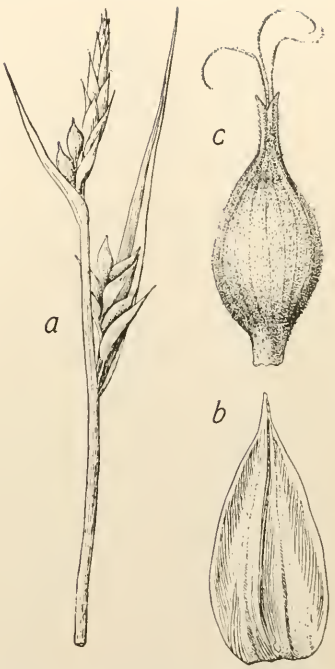

Fig. 26. Carex Brainerdii Mackenzie. *a*, inflorescence, × 2; *b*, scale, × 8; *c*, perigynium, × 8.

Locs.: Devils Basin, El Dorado Co., *Brainerd;* Johnson Lake, Yosemite, *Congdon;* Mt. Silliman, *Dudley* 1490; Hockett Meadow, Tulare Co., *Dudley* 1038; Kaweah Peaks, *Dudley* 2446; Camp Alta, Tulare Co., *Dudley* 991; Grant National Park, *Dudley* 1905; Tuolumne Meadows, *Dudley;* Lake Tahoe to Bear Valley, *Kellogg;* "Rocky Mts." California, *Kellogg;* Sierra Nevada, *Brannan & Kellogg;* Emigrant Gap, *M. E. Jones* 3307; Summit, Placer Co., *Heller* 9853; Cucamonga Peak, San Bernardino Co., *Johnston* 1496; Tuolumne Meadows, *Ware* 2721c; Soda Spgs., Tulare Co., *Dudley.*

Refs.: Carex brevipes W. Boott in S. Wats. Bot. Cal. 2: 246 (1880). *C. globosa* Boott var. *brevipes* W. Boott, l. c. 485. *C. deflexa* Hornem. var. *Boottii* Bailey, Mem. Torr. Club 1: 43 (1889), same type. *C. Rossii* Boott var. *brevipes* Kük. in Engler, Pflzr. 4[20]: 452 (1909).

68. C. Rossii Boott. Densely cespitose from stout rootstocks; culms wiry, smooth or slightly roughened above, 5-25 cm. high; leaf-blades 1-2.5 mm. wide, roughened toward apex; staminate spike sessile or nearly so, usually conspicuous, 3-10 mm. long, 1 mm. wide; pistillate spikes globose to short-oblong, 3-5 mm. long, 3-4 mm. wide, 2-12 flowered, the upper contiguous, the lower basal and long-peduncled; scales ovate, sharp-pointed; perigynia 3-4.5 mm. long, 1.25 mm. wide, nearly globose in cross section, abruptly beaked, the beak 0.75-1.5 mm. long, deeply bidentate.

Type Locality: Northwest Coast of North America (Douglas). Rocky Mountains (Drummond).

Dry soil, Michigan to Yukon and British Columbia south to Colorado and California, where it occurs in the northern mountains and extends south in the Sierra Nevada at least as far as Mariposa Co. While this is the most widely distributed and abundant species of the group in the western part of the United States, it has been but sparingly collected in California.

Locs.: Kneeland Prairie, Humboldt Co., *Tracy* 2657; Eureka, Humboldt Co., *Tracy* 2041, 2045, 2049; Crescent Lake, Mariposa Co., *Congdon;* Tuolumne Soda Spgs., *Congdon;* Sierra Nevada, *Kellogg;* Cisco, Sierra Nevada, *Kellogg;* Hat Creek, Shasta Co., *Eggleston* 7382, 7434, 7435, 7485; Pyramid Peak, El Dorado Co., *Hall & Chandler* 4749; Stanislaus Forest, Alpine Co., *Eggleston* 9324, 9498.

Refs.: Carex Rossii Boott, in Hook. Fl. Bor. Am. 2: 222 (1840); Kük. in Engler, Pflzr. 4^{20}: 452 (1909). *C. novæ-angliæ* Schw. var. *Rossii* Bailey, Bot. Gaz. 10: 207 (1885). *C. deflexa* Hornem. var. *Rossii* and var. *media* Bailey, Mem. Torr. Club 1:43 (1889), type from "Montana and Colorado to Oregon." *C. deflexa* Hornem. var. *Farwellii* Brit. in Brit. & Br. Ill. Fl. 1: 334 (1896), founded on var. *media*. *C. Farwellii* Mackenzie, Bull. Torr. Club 37: 244 (1910).

69. C. brevicaulis Mackenzie. Stoloniferous, the culms 5-10 cm. high, slender, very rough on the angles; leaf-blades 1.5-3.5 mm. wide, roughened above; staminate spike short-peduncled, few-flowered, 6-9 mm. long, 1.5-2 mm. wide; lateral spikes 2-4, 4-6 mm. long and nearly as wide, the upper 1-2 sessile and approximate, the others basal, slender peduncled; scales ovate, acute to short cuspidate, reddish-brown with lighter center and hyaline margins; perigynia about 4 mm. long, loosely short-pubescent, stipitate, the body globose, 2.25 mm. wide, abruptly contracted into the slender, serrulate, rather shallowly bidentate beak 1 mm. long.

Type Locality: Yaquina Bay, Oregon (Howell 2994).

Coast from British Columbia south to Monterey Co., California.

Locs.: Crescent City, *Davy & Blasdale;* Seal Cove, San Mateo Co., *Dudley;* Ben Lomond Mt., Santa Cruz Co., *Dudley;* San Francisco, *Kellogg;* Monterey, *Elmer* 4531.

Ref.: Carex brevicaulis Mackenzie, Bull. Torr. Club 40: 547 (1913).

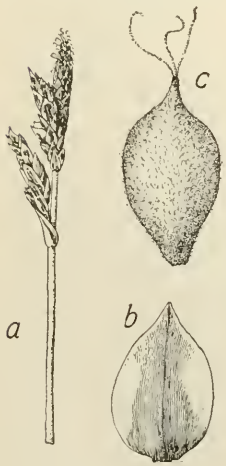

Fig. 27. Carex concinnoides Mackenzie.

a, inflorescence, × 1; *b*, scale, × 8; *c*, perigynium, × 8.

XIX. Digitatæ Fries. Culms slender, leafy at the base. Leaf-blades narrow, the sheaths usually strongly purplish. Terminal spike linear, staminate. Lateral spikes 1-5, approximate or separate or sometimes radical, oblong to linear, 5-20-flowered in few ranks, the peduncles included or exserted. Bracts sheathing, more or less strongly purplish-tinged, subspathaceous, the blade absent to rudimentary. Pistillate scales strongly purplish or reddish-brown tinged. Perigynia membranaceous, appressed, oblong-obovoid, pubescent to glabrate, triangular, long-tapering to the stipitate base, abruptly contracted into the minute beak, the orifice entire or nearly so. Achenes triangular, closely enveloped. Style short, thickened, jointed with the achene, deciduous. Stigmas 3, early deciduous.

70. C. concinnoides Mackenzie. (Fig. 27). Strongly stoloniferous, the culms 2.5 dm. high or less, smooth, slender; leaf-blades light green, 2-4 mm. wide; staminate spike nearly sessile, 8-22 mm. long; pistillate spikes 1 or 2, approximate, rather closely 5-10-flowered, 5-10 mm. long, 3 or 4-5 mm. wide, sessile or short-peduncled; scales narrowly ovate,hyaline-margined, acute to acuminate; perigynia 2.5-3 mm. long, 1.5 mm. wide, loosely pubescent, tapering to a short stipitate base, the body oblong-elliptic, abruptly contracted into the short entire beak, 0.5 mm.

long, wider and longer than the scales; achenes 2 mm. long, closely enveloped by perigynia.

Type Locality: Columbia Falls, Montana (R. S. Williams).

Dry soil, British Columbia to California, east to Alberta and Montana. In California it is known only from an old collection of Bolander.

Loc.: Red Mt., Mendocino Co., *Bolander* 6478 (in part).

Refs.: Carex concinnoides Mackenzie, Bull. Torr. Club 33: 440 (1906). "*C. Richardsonii* R. Br." W. Boott in S. Wats.Bot. Cal. 2: 246 (1880).

XX. Bicolores Tuckerm. Stoloniferous. Culms central, slender, leafy toward the base. Leaf-blades narrow. Basal sheaths light brown. Terminal spike linear, staminate or gynæcandrous. Lateral spikes 2-5, pistillate, rather closely few- to many-flowered in few ranks on erect, exserted peduncles. Bracts sheathing, not colored or dark-auricled, the blades elongated, leaf-like. Scales reddish- or purplish-brown tinged. Perigynia ascending, broadly oval or ellipsoid, circular in cross section, nerved, glabrous, golden-yellow or white-pulverulent at maturity, tapering or rounded at the base, essentially beakless. Achenes lenticular, apiculate, closely enveloped. Style slender at base, short, jointed with the achene, deciduous. Stigmas 2.

71. C. salinæformis Mackenzie. (Fig. 28). From long-creeping, slender rootstocks, the culms 5-15 cm. high, phyllopodic, smooth, bluntly triangular, not reddened or fibrillose at base; leaf-blades 2-3 mm. wide; staminate spike more or less peduncled, 8-12 (or 16) mm. long, 2-5 mm. wide; pistillate spikes 3 or 4, erect, the upper approximate, short-peduncled, the lower widely separate, long-peduncled, 6-12 mm. long, 3-4 mm. wide, with 8-15 appressed-ascending perigynia; bracts long sheathing; scales reddish-brown, obtuse or cuspidate; perigynia oblong-ovoid, straw-colored, flattened suborbicular in cross section, 2.5-3.75 mm. long, 1.75 mm. wide, rounded at base and apex, beakless but short tapering and slightly constricted at apex.

Type Locality: Mendocino City, California, (Bolander 4702).

Known only near the coast in Mendocino Co.

Fig. 28. Carex salinæformis Mackenzie.
a, inflorescence, × 1; *b*, scale, × 9; *c*, perigynium, × 9.

This plant with long sheathing bracts, the relationship of which is clearly with *Carex aurea* Nutt., was confused with the far northern *Carex subspathacea* Wormsk. by W. Boott in the Botany of California, and even in the Pflanzenreich (4[20]: 362) is referred to the northern *Carex salina* Wahl.

Locs.: Mendocino City, *Bolander* 4702; Fort Bragg, *Davy* 6139.

Refs.: Carex salinæformis Mackenzie, Bull. Torr. Club 36: 477 (1909). "*C. salina* Wahl, var. *minor* Boott" W. Boott in S. Wats. Bot. Cal. 2: 242 (1880). "*C. salina* Wahl." Kük., in Engler, Pflzr. 4[20]: 361 (1909) as to California plant.

72. C. Hassei Bailey. Rootstocks very slender, whitish, elongated; culms 1.5-6 dm. high, phyllopodic, sharply triangular, usually much roughened above, light-brownish at base; leaf-blades 2-4 mm. wide; staminate spike short-peduncled, 6-12 mm. long, 2-3 mm. wide, often pistillate at apex; pistillate spikes usually 3-5, the upper approximate and short-peduncled, the lower long-peduncled, linear-oblong, 8-20 mm. long, 3.5 mm. wide, with 6-20 ascending perigynia; bracts short-sheathing, the lowest exceeding culms; scales ovate, acute, reddish-brown tinged; perigynia obovoid, suborbicular in cross-section, straw-colored or pulverulent, 2.5-3 mm. long, less than 2 mm. wide, substipitate or tapering at base, slightly pointed; style becoming short-exserted and somewhat persistent.

Type Locality: San Antonio Cañon, San Bernardino Mts., California (Hasse).

River banks and wet rocks, Labrador to Yukon, south to Maine, Pennsylvania, Alberta, Utah and California, where known chiefly from the Sierra Nevada and the higher southern mountains except for its local occurrence in Santa Clara Co.

Locs.: San Gabriel River, *Hasse;* San Bernardino Range, *Hasse;* San Antonio Cañon, *Hasse;* San Bernardino, *Parish* 1055, 5219, 4688, 6932; Seven Oaks, San Bernardino Co., *Geo. B. Grant* 4033; Mt. Pinos, Kern Co., *Hall;* Dry Lake Cañon, San Gorgonio Mts., *Abrams & McGregor* 792; Mariposa Co., *Congdon;* Sierra Valley, Sierra Co., *Lemmon* 487; Loma Prieta Peak, Santa Clara Co., *Elmer* 4865; Yosemite, *Abrams* 4407; Deep Creek, San Bernardino Co., *Abrams* 2049; San Antonio Mts., *Johnston* 1391, 1413; Igerna, Siskiyou Co., *Heller* 8096; Bear Creek, Tulare Co., *Dudley* 2858; Sisson, *Dudley.*

Refs.: Carex Hassei Bailey, Bot. Gaz. 21:5 (1896); Parish, Bull. S. Cal. Acad. 4: 110 (1905). *C. aurea* Nutt. var. *celsa* Bailey, Mem. Torr. Club 1:75 (1889); Kük. in Engler, Pflzr. 4[20]: 509 (1909), type from San Bernardino Mts., Cal., *Vasey.* "*C. bicolor* All." Rob. & Fern. in A. Gray Manual (ed. 7) 232 (1908). *C. celsa* Piper in Piper & Beattie Fl. N. W. Coast 79 (1915), not Boott 1862. *C. aurea* Nutt. var. *androgyna* Olney in Bot. King, 371 (1871), type from Presque Isl., Pennsylvania, *Garber.*

73. C. aurea Nutt. Rootstocks slender, whitish, elongated; culms 0.3-4 dm. high, phyllopodic, smooth or somewhat roughened, triangular, light brownish at base; leaf-blades 2-4 mm. wide; staminate spike sessile or short-peduncled, 3-10 mm. long, 1.5-3 mm. wide; pistillate spikes usually 3-5, the upper approximate and short-peduncled, the lower from little to strongly separate and often strongly peduncled, 4-20 mm. long, 3-5 mm. wide, with 4-20 ascending perigynia; bracts sheathing, exceeding culm; scales ovate, obtusish to short cuspidate, reddish-brown tinged; perigynia broadly obovoid, brownish or at maturity golden yellow, broadly oval in cross-section, 2-3 mm. long, 1.5-2 mm. wide, tapering at base, umbonate and beakless.

Type Locality: Shores of Lake Michigan (Nuttall).

Wet places, Newfoundland to Yukon, south to Connecticut, Michigan, New Mexico and California, where confined to the Sierra Nevada and eastward, except for its local occurrence in the southern mountains.

Locs.: Mono Lake, *Brewer* 1839; Tuolumne Soda Spgs., *Bolander* 6220; Big Valley Mts., Modoc Co., *Baker & Nutting;* Tallac and Echo, El Dorado Co., *Brainerd;* Glen Alpine, Lake Tahoe, *McGregor* 21, *Blasdale;* Mt. Pinos, Ventura Co., *Hall* 6518; Mineral King, *Coville & Funston* 1429; Mt. San Antonio, *Wilder;* Bear Valley, San Bernardino Mts., *Abrams* 2847; Hockett Meadow, Tulare Co., *Dudley* 1007; Kennedys Meadows, Tuolumne Co., *A. L. Grant* 180*a* and 120; "California," *Kellogg & Harford* 1079; Little Grizzly Ranger Station, Plumas Co., *Eggleston* 7593; Jess Valley to Blue Lake, *Griffiths & Hunter* 416.

Refs.: Carex aurea Nutt. Gen. N. Am. Pl. 2: 205 (1818); W. Boott in S. Wats. Bot. Cal. 2: 240 (1880); Parish, Bull. S. Cal. Acad. 5: 36 (1906); Kük., in Engler, Pflzr. 4[20]: 508 (1909). *C. mutica* R. Br. in Richardson, App. Narr. Franklin Voy. 35 (1823), type from northwestern Canada between 54°-64°. *C. pyriformis* Schw. ex. Dewey Am. Jour. Sci. 9: 69 (1825), type from Berkshire Co., Mass. "*C. californica* Bailey" Parish, Bull. S. Cal. Acad. 5: 36 (1906).

XXI. Paniceæ Tuckerm. Stoloniferous. Culms central, slender, leafy toward the base. Basal sheaths brownish or purplish tinged. Terminal spike staminate, linear or linear-oblong. Lateral spikes 1-5, pistillate, loosely to rather closely several to many-flowered, in few or several ranks, on erect, exserted or included peduncles. Bracts sheathing, not colored or dark-auricled, the blades developed. Scales purplish- or reddish-brown tinged. Perigynia ascending or spreading, ovoid or obovoid, membranaceous, obtusely triangular, slightly inflated, glabrous, puncticulate, light or olive green, pointed or beaked, the orifice entire or nearly so. Achenes triangular, apiculate. Style slender, jointed with achene and at length deciduous. Stigmas 3.

74. C. livida Willd. Rootstocks very slender, elongated; culms 1.5-5 dm. high, smooth, light brownish at base, phyllopodic; leaf-blades more or less glaucous, involute, 2 mm. wide or less; staminate spike short-peduncled, 1.5-2.5 cm. long; pistillate spikes 1 or 2, approximate, erect, sessile or short-peduncled, 1-2 cm. long, 15 mm. wide, closely 5-15-flowered; bracts often exceeding culm, the sheaths short; scales ovate, chestnut or copper color with more or less hyaline margins; perigynia 3.75 mm. long, 1.75 mm. wide, the body ellipsoid, obscurely triangular in cross-section, glaucous, faintly nerved, narrowed above, tapering at base, pointed but beakless at apex, exceeding the scales.

Type Locality: In paludibus ad fontes sylvestres Lapponiæ Enontekensis.

Sphagnum bogs, Labrador to Alaska, south to New Jersey, Michigan and northern California, where known only from an old collection by Bolander.

Loc.: Mendocino, *Bolander* 4745.

Refs.: Carex livida Willd. Sp. Pl. 4: 285 (1805); W. Boott in S. Wats. Bot. Cal. 2: 244 (1880); Kük., in Engler, Pflzr. 4[20]: 510 (1909). *C. limosa* L. var. *livida* Wahl. Vet. Akad. Handl. Stockholm 24: 162 (1803). *C. Grayana* Dewey, Am. Jour. Sci. 25: 141 (1834), type from Utica, New York, *Gray*.

75. C. californica Bailey. (Fig. 29). Rootstocks stout, elongated; culms 2-4.5 dm. high, smooth, reddish-purple at base, strongly aphyllopodic, sharply triangular; culm-leaves 2-4, the blades 1.5-5 mm. wide, flat with revolute margins; staminate spike strongly peduncled, 1.5-3.5 cm. long; pistillate spikes 2-4, strongly separate, erect, the upper short exsert-peduncled, the lower often nearly basal, and long exsert-peduncled, linear-oblong, 1-3 cm. long, 3.5 mm. wide, with 7-20 appressed perigynia; bracts leaf-like, strongly exceeding spikes; scales ovate, purplish-brown with lighter midvein; perigynia 3.5-4 mm. long, 2 mm. wide, the body ovoid, suborbicular in cross-section, green, several-nerved, rounded at base, abruptly beaked, the beak 0.75 mm. long with oblique orifice.

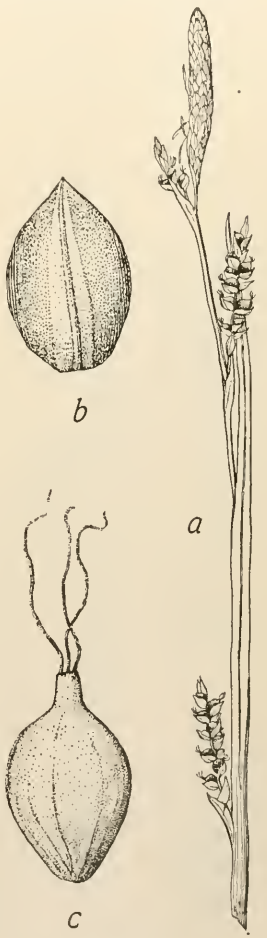

Fig. 29. Carex californica Bailey.

a, inflorescence, × 1; *b*, scale, × 8; *c*, perigynium, × 8.

TYPE LOCALITY: Mendocino City, California (Bolander 4741).

Meadows and prairies from northwestern California through western Oregon to southwestern Washington. Apparently rare and local.

A very well-marked species as far as any others known on the Pacific coast are concerned. It is however very closely related to *Carex polymorpha* Muhl., a rare and very local species found only east of the Alleghenies from Maine to Pennsylvania, which is a species very distinct from any others in the eastern United States. *Carex polymorpha* differs from the California species in its larger and longer beaked perigynia, much shorter bracts and fewer pistillate spikes.

LOCS.: Mendocino City, *Bolander* 4741; Mendocino Co., *Congdon*.

REFS.: CAREX CALIFORNICA Bailey, Mem. Torr. Club 1: 9 (1889), not Parish, Bull. S. Cal. Acad. 5: 36 (1906). "*C. polymorpha* Muhl." W. Boott in S. Wats. Bot. Cal. 2: 247 (1880). *C. polymorpha* Muhl. var. *californica* Kük. in Engler, Pflzr. 4[20]: 515 (1909).

FIG. 30. CAREX HENDERSONII Bailey.
a, inflorescence, × 2/3; *b*, scale, × 4; *c*, perigynium, × 4.

XXII. LAXIFLORÆ Kunth. Cespitose. Fertile culms mostly lateral, the sterile shoots leafy, conspicuous. Basal sheaths brownish or purplish-tinged. Terminal spike staminate, linear. Lateral spikes 2-5, pistillate or androgynous, loosely to closely few to many-flowered, in few to several ranks, on erect to drooping, included or exserted peduncles. Bracts sheathing, the sheaths green or purplish tinged, the blades leaf-like or sometimes reduced. Scales green with hyaline margins or more or less colored. Perigynia ascending, membranaceous, triangular, usually nerved, closely enveloping the achene, glabrous or hispidulous, tapering at the base, short-beaked or beakless, the orifice entire. Achenes triangular, apiculate. Style slender, jointed with the achene, and at length deciduous. Stigmas 3.

76. C. Hendersonii Bailey. (FIG. 30). Cespitose (often loosely so), the culms 4-8 dm. high, slender, sharply triangular, rough above; sterile shoots developing conspicuous culms; culm blades 3-8 mm. wide, 5-25 cm. long, those of the sterile shoots 4-10 mm. wide, 2-5 dm. long; terminal spike staminate, 2-3 cm. long, more or less peduncled; pistillate spikes 2-4, erect, linear, 12-25 mm. long, 4-6 mm. wide, with 5-12 alternate ascending perigynia, the upper spikes approximate, little if at all exsert-peduncled, the lower widely separate and often long exsert-peduncled; scales broadly obovate, mucronate, 3-nerved, green with hyaline margins, often reddish-brown tinged; perigynia narrowly ovoid, 5-6 mm. long, 2 mm. wide, long tapering and substipitate at base, tapering into a long straight scarcely differentiated beak obliquely cut at mouth.

TYPE LOCALITY: Bogs at Portland, Oregon (L. F. Henderson).

Damp woods in the California Coast Ranges from Sonoma Co. northward, extending throughout western Oregon and Washington and the southwestern part of British Columbia.

LOCS.: Mendocino City, *Bolander* 4747; Guerneville, *Davy;* Eureka, *Blankinship, Tracy* 2202, 4070; Little River, Humboldt Co., *Tracy* 3230; Scotia, Humboldt Co., *Dudley;* Sherwood Valley, Mendocino Co., *Dudley*.

REFS.: CAREX HENDERSONII Bailey, Proc. Am. Acad. 22: 115 (1886); Kük., in Engler, Pflzr. 4[20]: 527 (1909). "*C. laxiflora* Lam. var. *plantaginea* Boott" Olney, Proc. Am. Acad. 8: 407 (1872); W. Boott in S. Wats. Bot. Cal. 2: 245 (1880).

XXIII. Triquetræ Carey. Cespitose, leafy toward base. Leaf-blades narrow, the sheaths not purplish tinged. Terminal spike linear, staminate. Lateral spikes 2-4, approximate or more or less separate or sometimes radical, 5-20-flowered in few ranks, the peduncles included or exserted. Bracts sheathing, not purplish tinged, the lowest with a well-developed blade. Pistillate scales greenish or hyaline or reddish-brown tinged. Perigynia membranaceous, ascending, obovoid, short pubescent or glabrous, triangular, tapering and more or less stipitate at base, abruptly contracted into the minute beak, the orifice obliquely cut, minutely bidentate. Achenes triangular, closely enveloped. Style very short, thickish, jointed with the achene, withering and deciduous. Stigmas 3, early deciduous.

77. C. Whitneyi Olney. (Fig. 31). Cespitose, the culms 2.5-10 dm. high; foliage soft-pubescent, the sheaths loose, the blades 2.5-8 dm. wide; staminate spike short- or long-peduncled, 5-30 mm. long; pistillate spikes 2-4, approximate or lower more or less separate, erect, sessile or short-peduncled, suborbicular to linear-oblong, 7-20 (or 25) mm. long, 5-7 mm. wide, closely 5-30-flowered; lowest bract short-sheathing, about equaling culms; scales ovate, acute or short cuspidate, green, 3-nerved, broadly hyaline-margined; perigynia ascending, ob-ovoid or oblanceolate, sharply triangular, 4.5-5 mm. long, 2 mm. wide, green, puncticulate, about 5-nerved on each face, round-tapering at base, tapering into a smooth beak 0.75 mm. long, the orifice minutely bidentate in age.

Type Locality: Yosemite Valley, California (Brewer 1639).

Southern Oregon and northern California and south in the Sierra Nevada to Tulare Co. The statement is erroneously made by Kükenthal (Pflanzenreich 4^{20}: 581) that Parry collected the species in Colorado.

Locs.: Soda Spgs., *Brewer* 1778; Yosemite, *Jepson* 4348, *Bolander* 4969, *Congdon* 81, *Brewer* 1639, *Bolander* 6198, *Dudley;* Tuolumne Soda Spgs., *Congdon;* El Dorado Co., *Brainerd* 123; Donner Lake, Nevada Co., *Heller* 6941; Mt. Dana, *Bolander* 5086; Ebbetts Pass, *Brewer* 2025; Sierra Nevada, *Hillebrand* 2308, 2314; Tobias Meadow, Tulare Co., *Dudley* 614; Moraine Lake, Tulare Co., *Dudley* 2219, *Bolander & Keller* in 1872; Mariposa Co., *Congdon;* Tuolumne Meadows, *Jepson* 4477; Lassen Peak, *M. E. Jones;* Soda Spgs., Nevada Co., *M. E. Jones* 2514; Devils Kitchen, *R. M. Austin* 1300; Iron Cañon, Butte Co., *R. M. Austin* 57; Cahoon Meadow, Tulare Co., *Dudley.*

Refs.: Carex Whitneyi Olney, Proc. Am. Acad. 7: 394 (1868); W. Boott in S. Wats. Bot. Cal. 2: 248 (1880); Kük. in Engler, Pflzr. 4^{20}: 581 (1909). *C. pilosiuscula* Bœck. Flora 65: 61 (1882), type from salt plains of the Rocky Mts., *Donitz.*

78. C. gynodynama Olney. Cespitose, the culms 2-7 dm. high, slender, sharply triangular, brownish at base; leaves mostly clustered near base, the blades 3-9 mm. wide, sparsely and softly short pubescent; terminal spike staminate or with a few perigynia, sessile or short-peduncled, 1-2 cm. long; lateral spikes 2-4, oblong-cylindric, 1-3.5 cm. long, 6-9 mm. wide, erect, closely 20-40-flowered, the upper approximate, usually overtopping the staminate spike, short-peduncled, the lower strongly separate, long-peduncled; bracts with short blades; scales ovate-orbicular, short cuspidate or

Fig. 31. Carex Whitneyi Olney.

a, inflorescence, × 1; *b*, scale, × 6; *c*, perigynium, × 6.

obtuse, reddish-brown with lighter center and conspicuous hyaline margins; perigynia ascending, oblong-ovoid, 5 mm. long, 2 mm. wide, finely many-nerved, membranaceous, triangular, long hairy, round tapering at base, rounded and abruptly beaked at apex, the beak 0.75 mm. long, at length bidentulate.

Type Locality: Mendocino City, California (Bolander 4700).

Coast Ranges from southern Oregon as far south as San Mateo Co., California.

Locs.: Mendocino City, *Bolander* 4700; Anderson Valley, Mendocino Co., *Bolander* 4697; Sherwood Valley, Mendocino Co., *Dudley;* Butler Valley, Humboldt Co., *Tracy* 2620; Humboldt Hill, *Tracy* 2430, 2508; Hydesville, Humboldt Co., *Blankinship, Tracy* 3603; Kneeland Prairie, *Tracy & Babcock* 3821; Eureka, *Tracy* 3577, 3644; Fort Ross, Sonoma Co., *Heller* 6605; Guerneville, Sonoma Co., *Davy;* Pescadero, San Mateo Co., *Dudley.*

Refs.: Carex gynodynama Olney, Proc. Am. Acad. 7: 394 (1868); W. Boott in S. Wats. Bot. Cal. 2: 251 (1880); Kük. in Engler, Pflzr. 4[20]: 580 (1909). *C. Blankinshipii* Fern., Erythea 7: 121 (1899); type from Hydesville, Humboldt Co., California, *Blankinship.*

79. C. hirtissima W. Boott. Cespitose, the culms 3-6 dm. high, strictly erect, sparingly pubescent, not roughened on the angles, much exceeding the leaves; leaf-blades flat, 3-4 mm. wide, or up to 7 mm. on the sterile shoots, loosely hirsute on both surfaces; terminal spike staminate or gynæcandrous, from short- to long-peduncled, 1.5-2.5 cm. long, the scales oblong-obovate, glabrous, or slightly pubescent, strongly white margined; pistillate spikes 2-3, linear, 1-2.5 cm. long, 5 mm. wide, more or less strongly separate, the lower on long-exserted peduncles, closely flowered with 20-30 ascending perigynia; lower bract leaflike, sheathing, about equaling the culm; scales ovate or obovate, cuspidate or mucronate, shorter than perigynia, obscurely pubescent, the midrib green and the margins broad, white hyaline; perigynia loosely pubescent, 3.5-4 mm. long, 1.75 mm. wide, sessile, the body obovoid, 2.5-3 mm. long, obtusely triangular, the sides very obscurely striate, abruptly short-beaked, the beak 1 mm. long, hyaline, very shallowly bidentate.

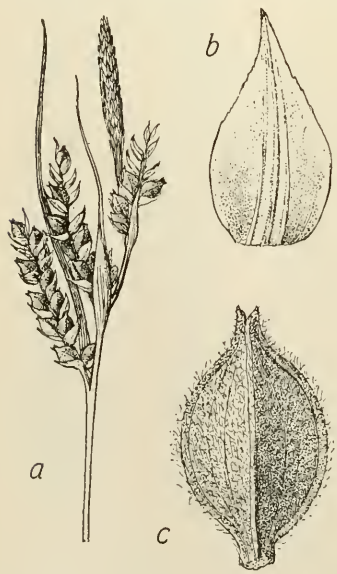

Fig. 32. Carex triquetra Boott. *a*, inflorescence, × 1; *b*, scale, × 8; *c*, perigynium, × 8.

Type Locality: Summit Camp, Sierra Nevada, California (Kellogg).

Rare and local in the central part of the Sierra Nevada.

Locs.: Summit Camp, *Kellogg;* Hetch-Hetchy, Tuolumne Co., *Congdon.*

Refs.: Carex hirtissima W. Boott in S. Wats. Bot. Cal. 2: 247 (1880); Kük., in Engler, Pflzr. 4[20]: 744 (1909).

80. C. triquetra Boott. (Fig. 32). Cespitose, the culms 3-6 dm. high, sharply triangular, stiffish, smooth or nearly so, leafy toward base; leaf-blades rigid, light green, 2.5-6 mm. wide, the sheaths cinnamon-brown tinged and purplish spotted ventrally; staminate spike 1-3 cm. long, short-peduncled; lateral spikes 3-4, pistillate, or staminate at apex, erect, the upper little exsert-peduncled, approximate and often exceeding the staminate spike, the lower 1-2 often widely separate and long exsert-peduncled, 1-4.5 cm. long, 4-7 mm. wide, the 5-30 perigynia ascending, closely arranged in few rows; lowest bract leaflet-like; scales ovate, short cuspidate, brownish copper-color with broad 3-nerved center and hyaline margins;

perigynia broadly obovoid, 4-4.5 mm. long, 2.75 mm. wide, softly short pubescent, light green, membranaceous, sharply triangular, several-nerved, short tapering at base, very abruptly beaked, the beak 0.3 mm. long, bidentate.

Type Locality: California, probably near Santa Barbara (Nuttall).

Dry hillsides below 2000 feet altitude in southwestern California from Santa Barbara Co. south and extending into the northern part of Lower California; erroneously recorded from Lassen Co.

Locs.: "California." *Nuttall;* San Diego, *Parry;* San Bernardino, *Parish* 4150, 1054, 4696; Arroyo Seco Cañon and Glendora, Los Angeles Co., *Geo. B. Grant* 139; Calban, San Bernardino Co., *Parish;* San Bernardino Valley, *Parish* 6250; Matilija Cañon, *Peckham;* Santa Monica Mts., *Hasse, Abrams* 1280; Ojai Valley, *Elmer* 3955, *Yates, Hubby;* Point Loma, San Diego Co., *Orcutt* 1075, *Eastwood* 2544, *Brandegee, Chandler* 5078; San Diego Co., *Geo. B. Grant* 3807, *Cooper* 1593, *Pringle* 487, *Cleveland & Greene;* Mt. Wilson, Los Angeles Co., *Davidson;* Avalon, Santa Catalina Isl., *Trask;* Los Angeles, *Hasse;* Ramona, *Brandegee;* Santa Inez Mts., *Brandegee;* Pasadena, *McClatchie;* San Antonio Mts., *Johnston* 1917.

Refs.: Carex triquetra Boott, Trans. Linn. Soc. 20: 126 (1846); W. Boott in S. Wats. Bot. Cal. 2: 247 (1880); Parish, Bull. S. Cal. Acad. 4: 112 (1905); Kük., in Engler, Pflzr. 4[20]: 489 (1909). *C. monticola* Dewey, Bot. Mex. Bound. 229 (1858), type from San Diego, California, *Parry.*

XXIV. Debiles Carey. Culms aphyllopodic, strongly purplish tinged at base, tufted, slender, leafy. Leaf-blades flat. Terminal spike normally staminate. Lateral spikes 2-5, elongate, narrowly linear, slender-peduncled, the lower often drooping. Bracts green sheathing, the blades leaflike. Perigynia appressed or ascending, lanceolate to ovoid, membranaceous, obsoletely nerved, rather closely enveloping the achene, tapering to a well-developed conic beak, obliquely cut at orifice and strongly hyaline-tipped, at length bidentate. Achenes triangular, apiculate, jointed with slender deciduous style. Stigmas 3.

81. C. mendocinensis Olney. (Fig. 33). Cespitose from elongated root-stocks, the culms slender, 3-8 dm. high, much exceeding leaves, reddish-purple at base; leaves sparsely pubescent, the culm blades 1.75-3 mm. wide, 5-12 cm. long, those of the sterile shoots 1.5-3.5 dm. long and somewhat wider; terminal spike staminate or with a few perigynia, 2-3.5 cm. long; pistillate spikes 2 or 3, slender, erect, linear, 1.5-4 cm. long, 3.5-5 mm. wide, closely flowered above, more loosely toward base, the 20-40 perigynia appressed-ascending; lowest bract about equaling culm; scales ovate, obtuse or short cuspidate, cinnamon-brown with broad hyaline margins; perigynia 3.5-5 mm. long, 1.5 mm. wide, oblong-obovoid, somewhat flattened, triangular, membranaceous, lightly nerved, minutely puberulent, somewhat tapering at base, abruptly beaked, the beak 0.5 mm. long, bidentate.

Fig. 33. Carex mendocinensis Olney.

a, inflorescence, × 2/3; *b*, scale, × 5; *c*, perigynium, × 5.

Type Locality: Mendocino City, California (Bolander 4701).

Along streams in the Coast Ranges of southwestern Oregon and northwestern California, where recorded only from Mendocino Co. and Humboldt Co.

Locs.: Red Mt., Mendocino Co., *Bolander* 6477; Mendocino, *Bolander* 4701; Three Creeks, Humboldt Co., *Tracy* 3343; "California." *Kellogg & Harford* 1082.

Refs.: Carex mendocinensis Olney ex W. Boott in S. Wats. Bot. Cal. 2: 249 (1880); Kük., in Engler, Pflzr. 4[20]: 580 (1909). *C. cinnamomea* Olney, Proc. Am. Acad. 7: 396 (1868) (not Boott, 1846), type from Mendocino Co., California, *Bolander* 6477. *C. debiliformis* Mackenzie, Bull. Torr. Club 37: 244 (1910), new name for *Carex cinnamomea* Olney.

XXV. Frigidæ Fries. Culms phyllopodic, tufted, the leaves clustered near the base. Spikes staminate, pistillate, androgynous or gynæcandrous. Bracts green-sheathing, the blades developed or rudimentary. Scales dark-tinged, usually with light midvein and margins. Perigynia appressed or ascending, flat to flattened-triangular, not inflated, dark-tinged, beaked, the beak hyaline at orifice, more or less bidentate. Achenes triangular, short apiculate, jointed with the straight slender style. Stigmas 3.

82. C. Lemmonii W. Boott. Rootstocks slender, more or less elongated, the culms slender, 4-8 dm. high, smooth, exceeding leaves, fibrillose at base; leaves mostly clustered near base, the blades flat, 1.75-4 mm. wide, erect or ascending; staminate spike 6-25 mm. long, 2.5-4 mm. wide, sessile or short-peduncled; pistillate spikes 2-4, linear-oblong, 0.5-2 cm. long, 3-6 mm. wide, 5-30-flowered, often staminate at apex, the upper approximate, the lower separate and exsert-peduncled; scales ovate, acute or obtuse, reddish brown with lighter center and broad hyaline margins; perigynia 3.5 mm. long or less, triangular, closely enveloping achene, puncticulate, glabrous, varying from green and slightly purplish-black tinged to purplish-black, obscurely nerved, tapering at base, abruptly beaked, the beak 1 mm. long, sparingly ciliate-serrulate, bidentulate, slightly hyaline at mouth.

Type Locality: Sierra Nevada, California (Lemmon).

Sierra Nevada from Tehama Co. to Tulare Co., and in the San Bernardino and San Jacinto mountains.

Locs.: Sierra Nevada, *Lemmon;* Big Tree Meadows, *Bolander* 4995; Inspiration Rocks, Yosemite, *Bolander* 4905; Matterhorn Cañon, Yosemite, *Jepson* 4500; Westfalls Meadows, Sierra Nevada, *Bolander* 6205 (in part); Pine Ridge, Fresno Co., *Hall & Chandler* 238 (in part); High Creek, Mt. San Gorgonio, *Geo. B. Grant* 6405; Deep Creek, San Bernardino Co., *Abrams* 2050; Bear Valley, San Bernardino Mts., *Abrams* 2816; Board Camp Creek, Tulare Co., *Dudley;* Yosemite, *Congdon* 80; Sequoia National Forest, *Davidson* 2131; Big Tree Grove, Mariposa Co., *Congdon;* Glen Alpine Spgs., Lake Tahoe, *Reed & Pendleton;* Strawberry Creek, El Dorado Co., *Brainerd* 30; Lassen Forest, Tehama Co., *Eggleston* 7302; North Creek, *Griffiths* 4557; Butterfly Valley, *R. M. Austin* 1033; Yosemite, *Hitchcock;* Stanislaus Forest, Tuolumne Co., *Eggleston* 9533; Eden Cañon, Tulare Co., *Dudley* 2800; Boulder Creek, Fresno Co., *Dudley* 3298.

Refs.: Carex Lemmonii W. Boott, Bot. Gaz. 9: 93 (1884). "*C. fulva* Good. var. *Hornschuchiana* Boott" W. Boott in S. Wats. Bot. Cal. 2: 250 (1880). "*C. ablata* Bailey" Parish, Bull. S. Cal. Acad. 4: 80 (1905). *C. Abramsii* Mackenzie, Bull. Torr. Club 36: 482 (1909), type from San Bernardino Co., Cal., *Abrams* 2816. "*C. serratodens* W. Boott" Kük., in Engler, Pflzr. 4[20]: 666 (1909), in part.

83. C. luzulina Olney. Culms densely cespitose, 1.5-7.5 dm. high; leaf-blades 3-8 mm. wide, stiff; spikes 4-8, the upper clustered, the lower widely separated, on long-exserted peduncles, the lateral pistillate, oblong, 6-8 mm. wide, the lowest sometimes compound at base; scales reddish-brown, obtuse or acutish; perigynium body compressed-triangular, closely enveloping achene, 3.75-5 mm. long, not inflated or hispidulous, contracted into the short or in age conspicuous, sparingly ciliate-serrulate shallowly bidentate beak.

Type Locality: Mendocino City, California (Bolander 4740).

Mountains in the western part of southern Oregon and northern California.

Locs.: Mendocino City, *Bolander* 4740; Bald Mt., Humboldt Co., *Tracy* 4531, 4543; Fort Bragg, *Congdon;* Santa Rosa Creek, *Bigelow.*

Refs.: Carex luzulina Olney, Proc. Am. Acad. 7: 395 (1868); W. Boott in S. Wats. Bot. Cal. 2: 249 (1880); Kük., in Engler, Pflzr. 4[20]: 557 (1909). "*C. cherokeensis* Schw." W. Boott, l. c. 248. *C. albida* Bailey, Mem. Torr. Club 1: 9 (1889), type from Santa Rosa Creek, Cal., *Thurber, Bigelow. C. luzulaefolia* W. Boott var. *ablata* Kük., f. *albida* Kük., in Engler, Pflzr. 4[20]: 558 (1909).

84. C. ablata Bailey. Rootstocks somewhat elongated, the culms slender, smooth or nearly so, 2.5-6 dm. high, much exceeding leaves, the latter 4-9 to a fertile culm, the blades 3-4.5 mm. wide, flat; spikes 3-7, the upper clustered and sessile or nearly so, the lower usually widely separate and on slender exserted peduncles, the terminal staminate or with a few perigynia, the lateral pistillate or staminate at apex, linear-oblong or linear-cylindric, 8-20 mm. long, 4-7 mm. wide; bracts shorter than inflorescence, long sheathing; scales ovate, obtuse, strongly exceeded by perigynia, reddish-black or brownish-black with lighter center and hyaline margins; perigynia lanceolate, greenish, compressed triangular, 3.5-4 mm. long, about 1.25 mm. wide, obscurely nerved, slightly ciliate-serrulate, rounded at base, tapering into the minutely bidentate beak scarcely 1 mm. long.

TYPE LOCALITY: Mount Mark, Vancouver Island (Macoun) is taken as the type.

Mountain meadows and bogs, Montana and Wyoming to British Columbia and extreme northern California.

Loc.: Shasta Forest, Siskiyou Co., *Eggleston* 11668.

REFS.: CAREX ABLATA Bailey, Bot. Gaz. 13: 82 (1888). "*C. ablata* Bailey in herb.," Macoun, Cat. Canad. Pl. 4: 139 (1888). "*C. frigida* All." Olney, Wats. Bot. King 371 (1871). *C. luzulæfolia* W. Boott var. *ablata* Kük., in Engler, Pflzr. 4:[20] 558 (1909). *C. owyheensis* A. Nelson, Bot. Gaz. 53: 219 (1912), type loc. Owyhee Mts., Idaho, *Macbride* 442.

85. C. luzulæfolia W. Boott. (FIG. 34). Culms 6-10 dm. high; leaves mostly clustered at the base, the blades 5-15 mm. wide, mostly 1-3 dm. long, thick and leathery; terminal spike more or less peduncled, usually about 1 cm. long and with 1-2 sessile staminate spikes at its base; pistillate spikes 3-4, all or only the lower strongly exsert-peduncled, widely separate,

FIG. 34. CAREX LUZULÆFOLIA W. Boott. *a*, inflorescence, × 1; *b*, scale, × 4; *c* perigynium, × 4.

the upper often equaling the staminate spikes, linear-oblong, 1.5-2.5 cm. long, 7.5 mm. wide, the 20-50 perigynia appressed; scales lanceolate, sharp-pointed, glabrous, purplish-black with conspicuous light mid-vein; perigynia 5-7.5 mm. long, 2.5 mm. wide, with oblong-ovate strongly flattened body, glabrous or with very few cilia on the margins, strongly purplish-black tinged, loosely enveloping achene, rounded at base, abruptly beaked, the beak slender, 1.5-2 mm. long, bidentate.

Type Locality: Above Ebbetts Pass near lake (Brewer 2019).

Sierra Nevada from Shasta Co. south to Tulare Co.

Locs.: Carson Pass, Alpine Co., *Brewer* 2131; Woods Peak, *Brewer* 2131 (in part); Pyramid Peak, El Dorado Co., *Hall & Chandler* 4747; Independence Lake, Nevada Co., *Hall & Babcock* 4537; Summit Camp, *Kellogg;* Mt. Tallac, *Abrams* 4838, 4850; Kaweah Peaks, *Dudley* 2212; Lake Tahoe region, *Abrams* 4861; Kennedys Lake, Tuolumne Co., *A. L. Grant* 479, 542; Devils Basin, El Dorado Co., *Brainerd* 28; Donner Pass, Placer Co., *Heller* 7187; Sierra Nevada, *Bolander, Hillebrand* 2312 (in part); Ebbetts Pass, *Brewer* 2019; Webber Lake, *Leiberg* 5261; Truckee, *Hitchcock* 399; Hat Creek, Shasta Co., *Eggleston* 7472; upper Bear Creek, Tulare Co., *Dudley* 2893; Soda Cañon near Big Arroyo, *Jepson* 1130.

Refs.: Carex luzulæfolia W. Boott in S. Wats. Bot. Cal. 2: 250 (1880), in greater part; Kük., in Engler, Pflzr. 4[20]: 558 (1909). *C. luzulæfolia* var. *strobilantha* Holm, Am. Jour. Sci. 20: 305 f. 18 (1905), type from Donner Lake, California, *Heller* 7187. *C. pseudo-japonica* C. B. Clarke, Kew Bull. Misc. Inf. add. ser. 8: 81 (1908), type from Donner Lake, California, *Heller* 7187.

In the Botany of California this species is mixed with Carex fissuricola. It is said to occur "in the Sierra Nevada, at high altitudes, from above Yosemite Valley to Ebbetts Pass and northward, *Brewer* n. 1701, 2019, 2131; *Bolander* n. 6210, 6219; *Kellogg.*" Of the specimens cited, *Brewer* 1701 and *Bolander* 6219 (Yosemite) are immature specimens of Carex fissuricola. *Brewer* 2019 and 2131 and the Kellogg specimens are mature specimens of the present species. *Bolander* 6210 is not represented in the W. Boott collection, but as represented in other herbaria it is Carex fissuricola. Most of the description including that of the perigynia is taken from the mature specimens, but the description of the scales is a mixture of both. W. Boott always cited specimens in numerical order. Under the circumstances I am taking *Brewer* 2019 as the type of the species.

86. C. fissuricola Mackenzie. Culms 5-8 dm. high; leaves mostly clustered at the base, the blades 3-6 mm. wide, 7-14 cm. long; terminal spike sessile or short-stalked, often slightly pistillate; lateral spikes 4-5, the upper contiguous and sessile or short-peduncled, the lower separate and strongly peduncled; scales ovate, acute to cuspidate, brown, with lighter midrib conspicuous to apex, sparsely hairy when young; perigynia body narrowly ovate, much flattened, loosely enveloping the achene, 5 mm. long, 2 mm. wide, sparsely hairy when young, remotely ciliate-serrulate on margins, contracted into a shallowly bidentate beak.

Type Locality: South Fork of Humboldt, Elko Co., Nevada (Heller 9429).

Mountain meadows western Nevada and the Sierra Nevada of California, from Tulare Co. north to El Dorado Co.

Locs.: Echo and Mrs. Watson's, El Dorado Co., *Brainerd;* Soda Spgs., Sierra Nevada, *Brewer* 1701; Yosemite, *Bolander* 6219; high Sierra Nevada, *Bolander* 6210; Chagoopa Creek Meadows, *Dudley* 2269, 2273; Mt. Whitney, *Dudley* 2481, 2483; Sawtooth, Tulare Co., *Dudley* 1615; Farewell Gap, *Dudley* 1006 (in part); Hockett Meadow, Tulare Co., *Dudley* 1008; Big Tree Grove, Mariposa Co., *Congdon;* Emigrant Gap, *Jones* 2917; Mineral King, *Coville & Funston* 1426, 1437; upper Bear Creek, Tulare Co., *Dudley* 2891.

Refs.: Carex fissuricola Mackenzie, Muhl. 5: 53 (1909). *C. luzulæfolia* W. Boott in S. Wats. Bot. Cal. 2: 250 (1880) in part. *C. ablata* Bailey, var. *luzuliformis* Bailey, Bot. Gaz. 25: 272 (1898), type from California, *Bolander* 6210. *C. luzulæfolia* W. Boott var. *ablata* Kük. f. *luzulæformis* Kük., in Engler, Pflzr. 4[20]: 558 (1909).

XXVI. Anomalæ Carey. Culms stout, leafy. Leaf-blades broad, flat, glabrous, not septate-nodulose. Terminal spike staminate, linear. Lateral spikes pistillate, linear-cylindric, scattered, closely many-flowered in several rows. Bracts leaflike, sheathless. Perigynia ascending or in age spreading, obovoid, small, 2.5-4 mm. long, olive green, nerved, tapering at the base, triangular, slightly inflated, thin, abruptly beaked, the beak conic, lightly bidentate. Achenes triangular, apiculate, more or less closely enveloped, the style short, straight, slender, jointed with achene, at length deciduous. Stigmas 3.

87. C. amplifolia Boott. (Fig. 35). Stoloniferous, the stolons stout, the culms 5-10 dm. high, sharply triangular, rough above, phyllopodic; sheaths hispidulous, purplish-brown tinged; leaf-blades 8-18 mm. wide; terminal spike staminate, 4-7 cm. long, 3-5 mm. wide; pistillate spikes 4 or 5, the upper approximate, the lower more or less strongly separate, short peduncled or nearly sessile, linear-cylindric, 3.5-8 cm. long, 6-7 mm. wide, with very many closely-packed spreading perigynia; scales acute to mucronate; perigynia 3 mm. long, obovoid, inflated triangular, brownish green, glabrous, nerveless except for keels, abruptly long beaked, the beak often excurved and with oblique hyaline orifice.

Type Locality: Columbia River (Douglas).

Wet soil, British Columbia to California, east to Idaho. Extends south in the Coast Ranges to San Mateo Co. and in the Sierra Nevada to Tulare Co.

Locs.: Big Trees, Mariposa Co., *Bolander* 5011, *Congdon;* Dinkey Creek, Fresno Co., *Hall & Chandler* 369; Sissons, *Brainerd* 98, *H. E. Brown* 319 (in part); Howell Mt., Napa Co., *Tracy* 1606; Shasta Retreat, *Heller* 7974, 7982; Sequoia Park, *Davidson* 2121; Jonesville, Butte Co., *Hall* 9782; Bald Mt., Humboldt Co., *Tracy* 4530; Sierra Valley, *Lemmon;* Yosemite, *Abrams* 4423; Squealer Gulch, San Mateo Co., *Dudley;* Mineral King, *Dudley* 1581; Kings Mt., San Mateo Co., *Abrams* 5563; Kaweah River, *Coville & Funston* 1354; Eel River, Mendocino Co., *Kellogg;* Bear Valley, *Bolander & Keller;* Peter Klink's Meadow, Siskiyou Co., *Dudley;* Harmon Meadow, Tulare Co., *Dudley* 2821.

Refs.: Carex amplifolia Boott in Hook. Fl. Bor. Am. 2: 228 pl. 226 (1840); W. Boott in S. Wats. Bot. Cal. 2: 248 (1880); Kük., in Engler, Pflzr. 4[20]: 617 (1909).

XXVII. Atratæ Kunth. Culms aphyllopodic or phyllopodic. Terminal spike gynæcandrous or staminate, the lateral 1-10 pistillate or with a few staminate flowers at base, from sessile, erect and closely approximate to long-peduncled, nodding and distant. Bracts sheathless or nearly so, dark-colored at the base, the blades short. Scales usually dark-tinged. Perigynia membranaceous or more or less coriaceous, straw-colored or greenish, often strongly dark-tinged, elliptic to broadly obovate, circular in cross-section to much flattened, papillose to punctulate, glabrous, abruptly short-beaked or beakless, the orifice entire or bidentate. Achenes triangular, apiculate-tipped, the style straight, slender, often exserted, articulated to the achene and in age deciduous, its base not enlarged. Stigmas 3.

88. C. spectabilis Dewey. Culms aphyllopodic, sharply triangular, few-leaved, purplish tinged at base, 2.5-5 dm. high from densely matted tough fibrous rootstocks; leaf-blades 2-3.5 mm. wide; terminal spike staminate, its scales with conspicuous more or less excurrent midvein; pistillate spikes 2-4, erect, oblong, 1-2 cm. long, 3.5-5 mm. wide, closely 15-30-flowered, not aggregated, the upper short peduncled, the lower long peduncled; lowest bract about equaling inflorescence; scales purplish-black with white often excurrent mid-

Fig. 35. Carex amplifolia Boott.
a, inflorescence, × 2/3; *b*, scale, × 5; *c*, perigynium, ×5.

vein; perigynia flattened, ovoid, sessile, rounded at base and apex, 4 mm. long, 2 mm. wide, abruptly minutely beaked, the beak bidentulate; achene short-stipitate.

Type Locality: "Found in the Arctic regions" but really from the Rocky Mts. of British America.

Mountains and meadows, Alaska to California, east to Montana. In California it is confined to the higher Sierra Nevada where it is known from Tulare Co. to Nevada Co.

Locs.: Ebbetts Pass, *Brewer* 2076, 2084, 2086; Carson Pass, *Brewer* 2106; Pyramid Peak, *Brewer* 2136; Lassen Peak, *Brewer* 2186; head of Tuolumne, *Brewer* 1773*a*; Cary Peak, Alpine Co., *Brewer* 2126, 2127; Big Trees, *Hillebrand* 2319; Mt. Dana, *Congdon;* Minarets, *Congdon;* Lake Lucille, *Hall & Chandler* 4656; Donner Lake, Nevada Co., *Heller* 7122; Lake Tahoe, *McGregor* 102 (in part); Mt. Lyell, *Hall & Babcock* 3582; Mt. Silliman, *Dudley* 1489; Black Peak, *Dudley* 2132; Kaweah Peaks, *Dudley* 2448; Rockslide Lake, *Dudley* 2382, 2383; Alta Peak, *Dudley* 1532 (in part); Marble Cañon, *Dudley* 1278; Heather Meadow, *Dudley* 1667; Craggy Peak and Caribou Peak, Siskiyou Co., *Dudley;* Little Kern River, *Dudley* 2553; Sierra Nevada, *Kellogg;* Donner Pass, *Torrey* 546; Little Kern River, *Purpus* 5238; Mt. Whitney, *Copeland* 47; Eagle Lake, Tulare Co., *Hall & Babcock* 5367; Bear Creek, Tulare Co., *Dudley* 2880; Giant Forest, *Dudley* 3003; Farewell Gap, *Dudley;* upper Bear Creek, Tulare Co., *Dudley* 2890.

Refs.: Carex spectabilis Dewey, Am. Jour. Sci. 29: 248, pl. 10. f. 76 (1836). *C. invisa* Bailey, Proc. Am. Acad. 22: 82 (1886), type from Summit Camp, Cal., *Kellogg.* "*C. podocarpa* R. Br." W. Boott, in S. Wats. Bot. Cal. 2: 245 (1880). *C. Tolmiei* Boott var. *invisa* Kük., in Engler, Pflzr. 4[20]: 412 (1909).

Fig. 36. Carex Raynoldsii Dewey.

a, inflorescence, × 1; *b*, scale, × 7; *c*, perigynium, × 7.

89. C. Raynoldsii Dewey. (Fig. 36). Rootstocks stout, stoloniferous, the culms 2-4 dm. high, stout, sharply angled, smooth or nearly so, little or not at all fibrillose, purplish tinged at base; leaf-blades 3-8 mm. wide, flat; terminal spike staminate, about 1.5 cm. long, 4 mm. wide, the lateral pistillate spikes 2 or 3, approximate or lowest separate, peduncled, erect, oblong, 1-2 cm. long, 7-8 mm. wide, closely 15-40-flowered; lowest bract about equaling culm; scales blackish with light midvein, nearly as wide as, but exceeded by the perigynia; perigynia oblong-oval, round in cross-section, 4.5 mm. long, 2 mm. wide, densely puncticulate, prominently 2-keeled and slenderly nerved, greenish straw-colored, rounded and substipitate at base, the very short beak minutely bidentate; achenes broadly obovoid, 2.25 mm. long.

Type Locality: "Pierre's Hole, Snake River Valley, alt. 6000 feet" (Hayden).

Mountain meadows and bogs, Alberta and Colorado to Washington and California. In California it occurs sparingly in the northern mountains but is mostly found in the Sierra Nevada, where it extends south to Tulare Co.

Locs.: Lake Tenaya, *Brewer* 1690, *Congdon, Hall & Babcock* 3645; Silver Valley, *Brewer* 1968; Meisners Ranch, El Dorado Co., *Brainerd* 81; Mt. Dana, *Bolander* 5088; Mono Pass, *Brewer* 1793, 1803; Peregoy Meadow, Yosemite Park, *Jepson* 4340; Big Trees, Calaveras Co., *Hillebrand* 2323 (in part); Summit, Placer Co., *Heller* 9854; Tobias Meadow, Tulare Co., *Dudley* 616; Sierra Nevada, *Kellogg;* Medicine Lake, Siskiyou Co., *Goldsmith* 5*a*; Tuolumne Meadows, *Jepson* 3259.

Refs.: Carex Raynoldsii Dewey, Am. Jour. Sci. (2) 32: 39 (1861); W. Boott in S. Wats. Bot. Cal. 2: 245 (1880); Kük., in Engler, Pflzr. 4[20]: 395 (1909). *C. Lyallii* Boott, Ill. Car. 4: 150, pl. 483 (1867), type from east side of the Cascade Mts., lat. 49°, *Lyall.*

90. C. bifida Boott. (Fig. 37). Cespitose but stoloniferous, the culms sharply triangular, slender, smooth, 4-8 dm. high, the basal sheaths purplish tinged and filamentose; leaf-blades 1.75-3.5 mm. wide; terminal spike 1.5-3 cm. long, sessile or short-peduncled, staminate or with some perigynia; pistillate spikes 3-5, erect, the upper approximate and sessile, the lower more or less separate and short-peduncled, oblong, 8-18 mm. long, 6-8 mm. wide, with 20-40 at length spreading perigynia; lowest bract exceeding culm, purplish tinged at base, scarcely sheathing; scales ovate, acute or rough mucronate, reddish-brown with lighter center, more or less strongly exceeded by perigynia; perigynia narrowly ovate, flattened triangular, about 10-nerved, 3-4.5 mm. long, green, puncticulate, membranaceous, sessile, rounded at base, abruptly short beaked, the beak 0.5-1 mm. long, bidentate, the teeth minute, rough and purplish tinged within.

Type Locality: Salinas Valley, Monterey Co., California (Brewer 574).

California, mostly in the Coast Ranges from San Luis Obispo and Kern Cos. and north to Jackson Co., Oregon.

Locs.: Red Mt., Humboldt Co., *Bolander* 6476; Salinas Valley, Monterey Co., *Brewer* 574; Tiburon, *E. L. Greene;* Tassajara Hot Spgs., Monterey Co., *Elmer* 3136; Santa Clara Co., *Smith* 17; Los Guilucos Valley, Sonoma Co., *Bioletti;* Spring Valley, San Mateo Co., *Congdon;* Alameda Co., *Geo. B. Grant* 2506; Santa Lucia Peak, *Jepson* 4739; Los Gatos, Santa Clara Co., *Heller* 8570; Loma Prieta, Santa Clara Co., *Elmer* 4624, 4997; Pacheco Pass, *Bolander* 4837; Tassajara, Monterey Co., *Dudley;* Woodside, San Mateo Co., *Dudley, Dutton, Abrams* 2425; Madrone, Santa Clara Co., *Dudley;* Coyote Creek, Santa Clara Co., *Dudley* 4146; Kings Mt., San Mateo Co., *Dudley;* Bisses Sta., Kern Co., *Dudley* 405*a*, 439; Mud Flat, Glenn Co., *Heller* 12349; Crystal Springs Lake, San Mateo Co., *Baker* 811; San Luis Obispo, *Jones* 3235; Tehachapi, Kern Co., *E. L. Greene;* Mt. Tamalpais, *Piper* 6430.

Refs.: Carex bifida Boott, ex Olney, Proc. Amer. Acad. 7: 394 (1868); W. Boott in S. Wats. Bot. Cal. 2: 238 (1880); Kük., in Engler, Pflzr. 4[20]: 666 (1909). *C. serratodens* W. Boott in S. Wats. Bot. Cal. 2: 245 (1880), type from California; Kük. l. c. *C. æqua* C. B. Clarke, Kew Bull. Misc. Inf. add. ser. 8: 86 (1908), type from San Mateo Co., California, *Baker* 811.

The description of *Carex serratodens* given by Kükenthal in the Pflanzenreich (4[20]: 666 [1909]) is partly based on the present species, and partly on specimens of *C. Lemmoni* W. Boott from the Sierra Nevada. I do not find that the distinctions he makes between it and *C. bifida* hold at all in the series of specimens I have seen.

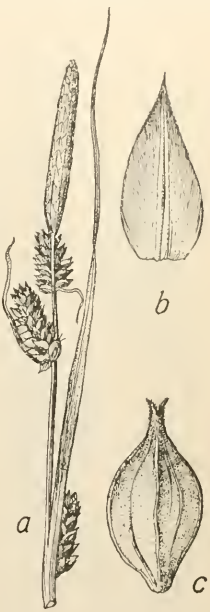

Fig. 37. Carex bifida Boott.

a, inflorescence, × 1; *b*, scale, × 7; *c* perigynium, ×7.

91. C. Buxbaumii Wahl. Densely cespitose, but with long stolons; culms 2-9 dm. high, sharply angled, rough above, slender but stiff, strongly reddish-purple and filamentose at base; leaf-blades 2-4 mm. wide, glaucous-green, long pointed; spikes erect, usually 3 or 4, 8-40 mm. long, 8 mm. wide, sessile or short-peduncled, with many perigynia; scales awned, dark purplish tinged, exceeding the perigynia; perigynia 3-4 mm. long, suberect, glaucous-green, obovoid, triangular, scarcely inflated, lightly many-nerved, densely papillose, short stipitate, the apex minutely bidentate.

Type Locality: Sweden and Lapland.

Bogs, Greenland to Alaska, south to Georgia, Arkansas, Colorado and California; also Eurasia. In California it is known only from an old collection by Bolander.

Loc.: Tuolumne Soda Spgs., *Bolander* 5056.

Refs.: Carex Buxbaumii Wahl. Vet. Akad. Handl. Stockholm 24: 163 (1803); W. Boott in S. Wats. Bot. Cal. 2: 238 (1880); Kük., in Engler, Pflzr. 4[20]: 393 (1909). *C. polygama* Schk. Riedgr. 1: 84, pl. 10 f. 76 (1801) (not J. F. Gmel. 1791), type from Germany and Denmark. *C. subulata* Schum. Fl. Saell. 1: 270 (1801) (not J. F. Gmel. 1791), type from Fahrum, Saellandia. "*C. fusca* All." Bailey, Mem. Torr. Club 1: 63 (1889).

92. C. Helleri Mackenzie n. sp. (Fig. 38). Very densely cespitose, the culms 0.5-3 dm. high, slender but strict, sharply triangular, roughened above, purplish tinged at base; leaf-blades flat with slightly revolute margins, 2-3 mm. wide; spikes 3-5, closely approximate, the terminal gynæcandrous, sessile or short-peduncled, the lateral pistillate, sessile or nearly so, oblong, 10-20 mm. long, 4.5-6 mm. wide, densely 25-50-flowered; lowest bract shorter than culm; scales ovate-lanceolate or lanceolate, acuminate or aristate, purplish-black with light midvein, longer but much narrower than perigynia; perigynia broadly oval to suborbicular, much flattened, 2.5-3.5 mm. long, nearly as wide, puncticulate, nerveless or nearly so, minutely and sparingly serrulate, abruptly beaked, the beak 0.25 mm. long, bidentate; achenes short stipitate.

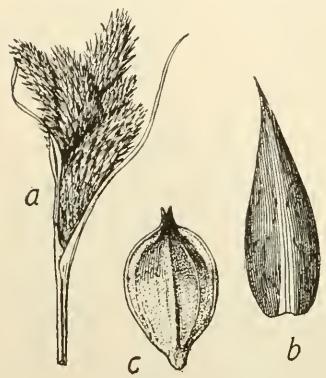

Fig. 38. Carex Helleri Mackenzie.

a, inflorescence, × 1; *b*, scale, × 7; *c*, perigynium, ×7.

Type Locality: Mt. Rose, Washoe Co., Nevada (Heller 9975).

High altitudes (8500-13600 feet) in the Sierra Nevada and White Mts. of California from Tulare Co. north to El Dorado Co. and in the high mountains of western Nevada.

Locs.: Mt. Brewer, *Brewer* 2840; Mt. Dana, *Bolander* 5072, *Hall & Babcock* 3610, *Congdon;* Cirque Peak, *Hall & Babcock* 5498; Denels Peak, *Hall & Babcock* 5507; Carson Pass, *Brewer* 2122; Yosemite, *Bolander* 5049 (in part); Harrison Pass, *Jepson* 5039; Alta Meadows, *Geo. B. Grant;* Kings River, *Lemmon;* Lake Lucille, *Hall & Chandler* 4663; Mono Co., *Congdon;* Sonora Peak, *A. L. Grant* 522 (in part); Alta Peak, *Dudley* 1534; Kaweah Peaks, *Dudley* 2114, 2449; Pyramid Peak, *Brewer* 2145 (in part); Mineral King, *Dudley* 1127; Little Kern River, *Purpus* 5140; Farewell Gap, *Purpus* 5261; White Mts., Mono Co., *Shockley* 613; Mt. Whitney, *Vernon Bailey* 2073; White Mts., *Jepson* 7395.

Refs.: Carex Helleri Mackenzie. "*C. atrata* L. var. *nigra* Boott" W. Boott in S. Wats. Bot. Cal. 2: 239 (1880).

93. C. epapillosa Mackenzie. Culms 1.5-6 dm. high, stiff, sharply triangular, smooth; leaves all toward the base of the culms, the blades 3-8 mm. wide, nearly flat; spikes 3-6, approximate or the lowest a little separate, sessile or short-peduncled, oblong-ovoid, 1-2.5 cm. long, 6-10 mm. wide, closely flowered in many rows; scales lance-ovate, sharp-pointed, brownish-black, narrower than but about equaling or exceeding the perigynia, the midvein more or less prominent; perigynia broadly oval or obovate, 3.5-4 mm. long, 1.5-2 mm. wide, obscurely nerved, not granular; achenes slender stipitate.

Type Locality: Marysvale, Utah (M. E. Jones 5345).

Mountain meadows, Wyoming to Utah and California. In California it is reported only from Sonora Peak.

Loc.: Sonora Peak, Tuolumne Co., *A. L. Grant* 394, 413, 522 (in part).

Ref.: Carex epapillosa Mackenzie in Rydb. Fl. Rocky Mts. 138 (1917).

94. C. heteroneura W. Boott. (Fig. 39). Densely cespitose, the culms 2.5-5 dm. high, slender, smooth or somewhat roughened above; leaf-blades 2-4 mm. wide; spikes about 4, approximate or lower more or less strongly separate, the terminal gynæcandrous (rarely staminate), the lateral pistillate, the lower on peduncles ½ their own length, the upper sessile or short-peduncled, oblong, 1-2 cm. long, 5-7 mm. wide, closely flowered, with 15-40 appressed-ascending perigynia; lowest bract shorter than to exceeding culms; scales acute, ½ to ⅔ width of perigynia, purplish-brown with conspicuous midvein, acute; perigynia suborbicular, strongly flattened, 2.5-3.5 mm. long, 1.75-2.5 mm. wide, rounded at base and apex, punctic-ulate, not rough, the beak 0.25 mm. long, minutely bi-dentate; achene short stipitate.

Type Locality: Lake Tahoe to Bear Valley, California, (Kellogg).

Sierra Nevada at elevations of 7000-11000 feet, from Tulare Co. to Siskiyou Co., and also in the mountains of western Nevada.

Fig. 39. Carex heteroneura W. Boott.

a, habit, × 1; *b*, scale, × 10; *c*, perigynium, × 8.

Locs.: Tuolumne River or Meadows, *Brewer* 1773, *Bolander* 1773, 5046 (in part), *Jepson* 4475, *Congdon;* Yosemite, *Congdon, Dudley, Hitchcock, Hall & Babcock* 3457, *Bolander* 6205 (in part); Donner Pass, *Torrey* 549; Mt. Dana, *Bolander* 6020 (in part); upper San Joaquin, *Congdon;* Sierra Nevada, *Kellogg & Harford* 1080, *Bolander* 61; Silver Valley, Alpine Co., *Brewer* 1964 (in part) and 1967; Brown Meadow, Tulare Co., *Hall & Babcock* 5160; Ebbetts Pass, *Brewer* 1994, 2013 (in part), 2023, 2080; Pyramid Peak, *Brewer* 2145 (in part); Big Trees, Calaveras Co., *Hillebrand* 2307, 2320, 2323 (in part); Alta Meadows, *Geo. B. Grant;* Mt. Whitney, *Jepson* 5053; Lake Tenaya, *Brewer* 1682, *Congdon* 93; Hockett Meadow, *Culbertson* 4386; Ostranders Meadow, *Bolander* 5015; Westfalls Meadow, *Bolander* 6205 (in part); Sonora Pass, Tuolumne Co., *A. L. Grant* 142, 277, 297; Medicine Lake, Siskiyou Co., *Goldsmith* 28; Sequoia National Park, *Davidson* 2123; Summit of Sierra Nevada, *Kellogg;* Wolverton Creek, Kaweah River, *Hopping* 436; Soda Spgs., Tulare Co., *Dudley* 1948; Chagoopa Creek, *Dudley* 2274, 2276, 2278; Hockett Meadow, *Dudley* 1037; Kaweah River, *Dudley* 1412; Little Kern River, *Dudley* 2552; Cone Peak Camp, *Dudley;* Cabin Meadow, *Dudley* 3331; Mountain Lake, *Dudley* 941; Round Meadow, *Dudley* 1058; Funston Meadows, *Dudley* 2209; Tobias Meadow, *Dudley* 665; Lloyd Mt., *Dudley* 852; upper Kings River, Fresno Co., *Dudley;* Slippery Ford, El Dorado Co., *Brainerd* 90; Snowy Falls, El Dorado Co., *Brainerd* 87; Lone Pine, *M. E. Jones;* Truckee, *Hitchcock* 356 (in part); White Mts., *Jepson* 7345; Bloody Cañon, Mono Co., *Ware* 2715c (in part); Stanislaus Forest, Alpine Co., *Eggleston* 9501, 9567; Kennedy Meadow, *A. L. Grant* 86; Donner Lake, *Greene;* Thorps Meadow, Tulare Co., *Dudley* 3004; San Jacinto Mts., *Hasse, Davidson, Reed* 2498; San Bernardino Mts., *Grinnell, Parish* 3277; Mt. San Gorgonio, *Geo. B. Grant* 6404.

Refs.: Carex heteroneura W. Boott in S. Wats. Bot. Cal. 2: 239 (1880). "*C. atrata* L." and "*C. atrata* L. var. *erecta*" W. Boott, l. c.; Kük., in Engler, Pflzr. 4^{20}: 399 (1909), type of var. *erecta* from California, but not otherwise given. *C. quadrifida* Bailey, Proc. Cal. Acad. (2) 3: 104 (1891), type loc. Mt. Dana, *Bolander* 5046, and var. *lenis* Bailey, l. c. 3: 105 (1891), also based on *Bolander* 5046. *C. quadrifida* Bailey var. *cæca* Bailey, Bot. Gaz. 21: 8 (1896), type from Tahquitz Valley, San Jacinto Mts., California; Parish, Bull. S. Cal. Acad. 4: 82 (1905). *C. atrata* L. subsp. *atratiformis* Brit. f. *cæca* Kük., in Engler, Pflzr. 4^{20}: 400 (1909).

95. C. albo-nigra Mackenzie. Loosely cespitose from slender creeping rootstocks, the culms 1.5-3 dm. high, slender, smooth or somewhat roughened above, sharply triangular; leaf-blades about 2.5 mm. wide, the sheaths white hyaline ventrally; spikes about 3, closely approximate, the terminal gynæcandrous, the lateral pistillate, sessile or very nearly so, linear-oblong, about 1 cm. long, and 4.5

mm. wide, closely flowered with 15-20 appressed-ascending perigynia; lowest bract shorter than culm; scales narrower than perigynia, ovate, acutish, purplish-black with light midvein; perigynia obovate, strongly flattened, 3 mm. long, 1.75 mm. wide, strongly papillate-roughened above, nerveless ventrally, lightly nerved dorsally, round-tapering and substipitate at base, abruptly minutely beaked, the beak 0.25 mm. long, minutely bidentate; achenes somewhat narrower than perigynia, short stipitate.

Type Locality: Needle Mt., Wyoming (Cary 613).

Mountain meadows, California east to Arizona and Colorado, north to Montana.

Loc.: Glacier Lake, Tulare Co., *Dudley* 1699.

Ref.: Carex albo-nigra Mackenzie in Rydb. Fl. Rocky Mts., 137 (1921).

96. C. Mertensii Prescott. Cespitose and short stoloniferous, the culms 3-10 dm. high, sharply triangular, rough, the lower sheaths brownish-purple tinged; leaf-blades flat, 4-7 mm. wide; spikes 6-10, 1-4 cm. long, 7-10 mm. wide, gynæcandrous, the upper approximate, the lower more remote on capillary peduncles, the upper most strongly staminate at base, the lateral sparingly; perigynia numerous, appressed-ascending; scales lance-ovate, acute, brown with light midvein and margins; perigynia broadly oval, much flattened, 5 mm. long, 3 mm. wide, rounded at base, papery, yellowish-green, purple-spotted, tapering at the apex, minutely beaked, the beak 0.5 mm. long, entire; achene 0.8 mm. wide, 2 mm. long, strongly stipitate.

Type Locality: Sitka, Alaska.

Mountains, Alaska to northern California, east to Montana. A very well marked and handsome species abundant further north, which has but recently been found in Trinity Co.

Loc.: North Fork, Coffee Creek, Trinity Co., *Goldsmith* 20.

Refs.: Carex Mertensii Prescott, Mem. Acad. St. Petersb. (2) 6: 168 (1833); Kük., in Engler, Pflzr. 4^{20}: 400 (1909). *C. columbiana* Dewey, Am. Jour. Sci. 30: 62 (1836), type from Columbia River, *Scouler*.

XXVIII. Acutæ Fries. Culms leafy below, aphyllopodic or phyllopodic. Terminal 1-several spikes staminate (rarely gynæcandrous), linear, the others pistillate, linear to cylindric or oblong, closely many-flowered, sessile or peduncled. Bracts sheathless or rarely short-sheathing, leafy or squamiform, often bi-auriculate and darkened at the base. Perigynia membranaceous to coriaceous, plano- or bi-convex or turgid, elliptic to obovate, puncticulate, margined, beakless or abruptly minutely beaked, the orifice entire to deeply bidentate. Achenes normally lenticular. Style straight, slender, sometimes exserted, jointed to achene and deciduous, its base not enlarged. Stigmas normally 2.

97. C. scopulorum Holm. Loosely stoloniferous; culms solitary or in small clumps 1-4 dm. high, stiff, sharply triangular, smooth; leaf-blades 3-7 mm. wide with revolute margins; terminal spike staminate or androgynous; lateral spikes 2-3, approximate, erect, sessile or short-stalked, pistillate or androgynous, 1-2.5 cm. long, 6-7 mm. wide; lowest bract shorter than inflorescence; scales obtuse, exceeded by perigynia, black, the midvein obsolete; perigynia 2.5-3.5 mm. long, soon turgid, papillose, spreading, nerveless, with short but prominent entire beak.

Type Locality: Clear Creek Cañon, Colorado (Holm).

Mountains from Montana and Washington to Colorado and the Sierra Nevada of California, where rare and only reported from Tulare Co.

Loc.: Kern River, Tulare Co., *Coville & Funston* 1706.

Refs.: Carex scopulorum Holm, Am. Jour. Sci. (4) 14: 421, f. 1-6 and 422 (1902); Kük., in Engler, Pflzr. 4[20]: 303 (1909). *C. Tolmiei* Boott var. *subscssilis* Bailey, Mem. Torr. Club 1: 47 (1889) in part.

98. C. gymnoclada Holm. (Fig. 40). Loosely and strongly stoloniferous, the culms phyllopodic, stiff, sharply triangular and usually roughened above, exceeding leaves, brownish at base; culms usually developing some very short blades the first year and in the flowering (second) year 2-4 erect blades, 2.5-4 mm. wide, flat with revolute margins; staminate spike short-peduncled, 5-15 mm. long; pistillate spikes 2 or 3, approximate, sessile or short-peduncled, oblong or linear-oblong, 5-15 (or 22) mm. long, 4-6 mm. wide, the perigynia 8-30, spreading-ascending, closely packed; lowest bract usually shorter than culm; scales ovate or lanceolate, obtuse to acuminate, purplish-black, the midvein usually obsolete; perigynia obovoid, plano-convex, not turgid, 3 mm. long, 1.75 mm. wide, straw-colored, often dark tinged, nerveless except for marginal ribs, membranaceous, granular, rounded at base, abruptly minutely beaked, the beak straight, 0.25 mm. long.

Type Locality: Bogs of Hurricane Creek, eastern Oregon (Cusick).

Higher portions of the Sierra Nevada from Tulare Co., northward; also northward in the mountains of Oregon and Washington, and eastward to Colorado.

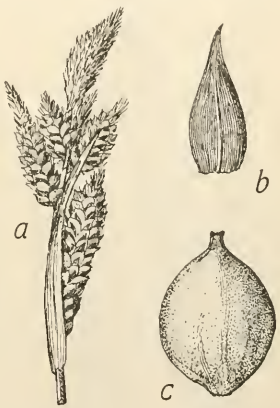

Fig. 40. Carex gymnoclada Holm.
a, inflorescence, × 1; *b*, scale, × 7; *c*, perigynium, × 7.

Locs.: Mt. Baldy near Shasta City, *Brewer* 1458; Ebbetts Pass, *Brewer* 2015, 2067; Silver Mt., *Brewer* 2015; Mt. Dana, *Bolander* 6020 (in part); Yosemite, *Bolander* 5049 (in part), *Hall & Babcock* 3493; Cathedral Trail, Mariposa Co., *Congdon;* Soda Spgs. of San Joaquin, *Congdon;* Lake Audrain and Strawberry Creek, El Dorado Co., *Brainerd;* Olancha Mt., *Hall & Babcock* 5248; Crescent Lake, Mariposa Co., *Congdon;* Alta Meadows, Tulare Co., *Geo. B. Grant;* Round Meadow, Tulare Co., *Dudley* 1057; Hockett Meadow, *Dudley* 1009, 1861; Grant Park, *Dudley* 1224; Camp Alta, Tulare Co., *Dudley* 981; Kings River, Fresno Co., *Dudley;* Mountain Lake, Tulare Co., *Dudley* 960 (in part); Sonora Pass, Tuolumne Co., *A. L. Grant* 267, 389, 411; Kennedy's Lake, *A. L. Grant* 511; Mineral King, *Coville & Funston* 1432; Mt. Eddy, Siskiyou Co., *Eggleston* 11569, 11580; Sequoia Park, *Geo. B. Grant.*

Refs.: Carex gymnoclada Holm, Am. Jour. Sci. (4) 14: 424 f. 12-14 (1902); Kük. in Engler, Pflzr. 4[20]: 323 (1909). "*Carex vulgaris* Fries. var. *alpina* Boott" W. Boott in S. Wats. Bot. Cal. 2: 240 (1880). *Carex Tolmiei* Boott var. *subsessilis* Bailey, Mem. Torr. Club 1: 47 (1889) in part, type from east Oregon, *Cusick* 1178, 1180 and Gray's Peak, Colo., *Patterson. C. vulgaris* Fries var. *bracteosa* Bailey, Proc. Am. Acad. 22: 81 (1886), type from Ebbetts Pass, Cal., *Brewer* 2015. *C. brachypoda* Holm, Am. Jour. Sci. (4) 20: 302, f. 4-6 (1905), type from Crater Lake, Oregon, *Coville* 1455.

In Carex concolor R. Br. (*C. rigida* Good.) and C. scopulorum Holm, which are the closest allies of this species, the flowering culms develop a number of long bladed leaves the first year, which persist during the second (flowering) year in a dry condition. In the present species these leaves are less developed, thus giving the plants a markedly different appearance. The granular perigynia also serve to separate it from *Carex concolor,* and the non-turgid straight-beaked perigynia from *Carex scopulorum.*

99. C. nebraskensis Dewey. (Fig. 41). Rootstocks creeping and stoloniferous; culms 2.5-10 dm. high, stout, rigid, roughened or smooth above; leaf-blades pale green, 3-8 mm. wide, flat, the sheaths nodulose, white hyaline ventrally; stam-

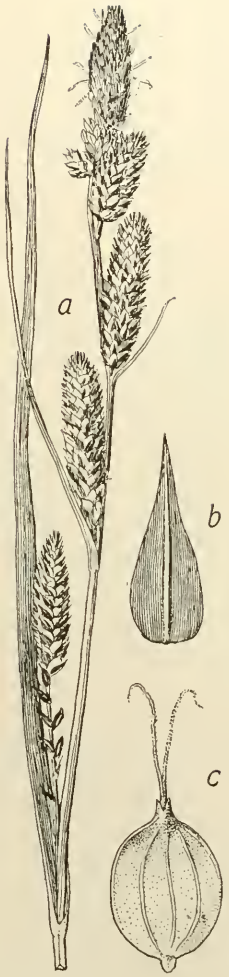

FIG. 41. CAREX NEBRASKENSIS Dewey.

a, inflorescence, × 1; *b*, scale, × 7; *c*, perigynium, × 7.

inate spikes 1-2, more or less peduncled, 1.5-3.5 cm. long, 3-6 mm. wide; pistillate spikes 2-5, oblong, sessile or short-peduncled, 1.5-6 cm. long, 6-9 mm. wide, contiguous or the lower separate, with very many ascending perigynia; lowest bract equaling culm; scales lanceolate, obtusish to acuminate, blackish with light midvein; perigynia ascending, 3-3.5 mm. long, 2 mm. wide, greenish straw color, compressed bi-convex, ribbed, rounded at base, sessile, contracted at apex into the bidentate beak.

TYPE LOCALITY: Nebraska (Hayden).

Meadows and swamps, South Dakota and Kansas to New Mexico, California and British Columbia. In California it is found in the extreme northern part of the state and it also occurs, apparently abundantly, throughout the Sierra Nevada and in the southern mountains.

Locs.: Silver Valley, *Brewer* 1970; Big Trees, *Hillebrand* 2309; Sierra Nevada, *Bigelow, Lemmon;* Hog Ranch, Yosemite, *Hall & Babcock* 3331; mountains of El Dorado Co., *Brainerd;* Truckee, *Heller* 7172; Bishop, *Heller* 8352; Panamint Cañon, Inyo Co., *Hall & Chandler* 7039; Bonita Meadows, Tulare Co., *Hall & Babcock* 5182; Sierra Valley, *Hall & Babcock* 4475; Donner Lake, *Heller* 6913; ne. Modoc Co., *Manning* 439; San Jacinto Mts., *Hall* 2484, 2559, *Hasse;* Tallac, El Dorado Co., *Brainerd* 59; Ostranders Meadow, *Bolander* 5018; Sisson, *Setchell & Dobie;* Huckleberry Meadow, Kaweah River, *Hopping* 465; Lake Tahoe, *Geo. B. Grant, Abrams* 4804; Mt. Pinos, *Hall* 6519; Siskiyou Co., *Butler* 858; Sequoia National Park, *Davidson* 2130; San Bernardino Mts., *Parish* 1577, 1578, 3280, *Reed* 985; Juniper Ridge, Sierra Co., *Dudley;* East Hot Spgs., Sierra Valley, *Dudley;* Sierra Valley, *Lemmon;* Grant Park. *Dudley* 1204; McCloud, Siskiyou Co., *Dudley;* Sonora Pass, *A. L. Grant* 390; Bear Valley, San Bernardino Co., *Abrams* 2925 (in part); Mrs. Watson's, El Dorado Co., *Brainerd* 61; Lone Pine, *M. E. Jones, Jepson* 5154; Jess Valley, *Griffiths & Hunter* 432; Surprise Cañon, Panamint Mts., *Coville & Funston* 719; Hobart Mills, Nevada Co., *Wagener;* Big Meadow, Tulare Co., *Dudley* 3076; Donner Lake, *Dudley.*

REFS.: CAREX NEBRASKENSIS Dew. Am. Jour. Sci. (2) 18: 102 (1854). *C. Jamesii* Torr. Ann. Lyc. N. Y. 3: 398 (1836), not Schw. (1824), type collected in the "Rocky Mountains, Dr. James"; W. Boott in S. Wats. Bot. Cal. 2: 243 (1880); Kük. in Engler, Pflzr. 420: 317 (1909). *C. Jamesii* Torr. var. *nebraskensis* Bailey, Proc. Am. Acad. 22: 84 (1886). *C. nebraskensis* Dew. var. *prævia* Bailey, Mem. Torr. Club 1: 49 (1889), based on *Carex Jamesii* Torr.; Parish, Bull. S. Cal. Acad. 4: 84 (1905). *C. nebraskensis* Dewey var. *ultriformis* Bailey, Bot. Gaz. 21: 8 (1896), type from Ritzville, Wash., *Sandberg & Leiberg* 194. *C. jacintoensis* Parish, Bull. S. Cal. Acad. 4: 110, pl. 16 (1905), type from San Jacinto Mts., Cal., *Hall* 2483.

100. C. paucicostata Mackenzie n. sp. Cespitose with stout short ascending stolons, the culms slender, sharply triangular, smooth or little roughened, 2.5-4 dm. high, phyllopodic; sheaths smooth, very thin and hyaline ventrally; blades light green, 2-4 mm. wide, flat or channeled at the base; staminate spike solitary, short-peduncled or nearly sessile; pistillate spikes 4-6, linear, 3.5-5 mm. wide, 1-4 (mostly 2-3) cm. long, the numerous perigynia appressed-ascending; lower bracts exceeding culms; scales oblong, obtuse or acutish, blackish with

lighter center and hyaline apex, somewhat shorter than perigynia, falling early but after perigynia; perigynia very broadly ovate or obovate or suborbicular, 2 mm. long, 1.5-2 mm. wide, glaucous green, 3-5-ribbed ventrally, papillate roughened, short-stipitate, the upper empty part inconspicuous, minutely and abruptly black apiculate tipped.

Type Locality: Summit Camp, California (Kellogg).

Wet places, mostly around lakes, in the Sierra Nevada, known from Tulare Co. to El Dorado Co.

Locs.: Yosemite, *Bolander* 6198; Lake Tenaya, *Congdon;* Crescent Lake, Mariposa Co., *Congdon;* Lake Mary, Mono Co., *Congdon;* Hockett Meadow, Tulare Co., *Dudley* 1006 (in part); Kern Lake, Tulare Co., *Dudley* 2044; Little Lake, El Dorado Co., *Brainerd* 76; Strawberry Creek, El Dorado Co., *Brainerd* 35; Truckee, *Hitchcock* 258; Stanislaus Forest, Alpine Co., *Eggleston* 9517; Silver Lake, Amador Co., *Brewer* 2099; South Fork, San Joaquin River, *Hall & Chandler* 651; Harmon Meadow, Tulare Co., *Dudley* 2819.

Refs.: Carex paucicostata Mackenzie. *C. interrupta* Bœckl. var. *impressa* Bailey, Mem. Torr. Club 1: 18 (1889). "*Carex lenticularis* Michx." W. Boott in S. Wats. Bot. Cal. 2: 242 (1880) in part.

101. C. Hindsii C. B. Clarke. Cespitose with stout short ascending stolons, the culms brownish at base, slender, sharply triangular, smooth or little roughened, 1-6 dm. high, phyllopodic; sheaths smooth, very thin and hyaline ventrally; blades 1.5-3 mm. wide, flat or channeled at the base; staminate spike solitary, long-peduncled; pistillate spikes 4-6, linear or oblong-linear, 5-7 mm. wide, 1.5-4.5 cm. long, the numerous perigynia appressed-ascending; lower bracts exceeding culms; scales oblong, obtuse or acutish, blackish with lighter center and hyaline apex, early deciduous, much shorter than perigynia; perigynia ovate, 2.5-3.5 mm. long, 1.5-2 mm. wide, yellowish green, ribbed, papillate roughened, strongly stipitate, the upper part empty, minutely black apiculate tipped.

Type Locality: Columbia River (Hinds).

Wet places along the coast from the Aleutian Islands to northwestern California, where reported only from Del Norte Co.

Loc.: Crescent City, *Dudley*.

Refs.: Carex Hindsii C. B. Clarke, Kew. Bull. Misc. Inf. Add. Ser. 8: 70 (1908); Kük. in Engler, Pflzr. 4[20]: 307 (1909). *C. decidua* Boott, Ill. Car. 1: 163 (1858), as to N. Am. plant. *C. vulgaris* Fries var. *lipocarpa* Holm, Am. Jour. Sci. (4) 17: 308 (1904), in part, type not definitely designated.

102. C. Kelloggii W. Boott. Cespitose, with very short ascending stolons; the culms 3-7 dm. high, light-brownish and somewhat fibrillose at base, phyllopodic, slender, somewhat roughened; sheaths smooth, very thin and white hyaline ventrally; leaf-blades light green, flat or somewhat channeled at base, 1.5-3 mm. wide; staminate spike usually one, 12-36 mm. long, 3-4 mm. wide; pistillate spikes 3-5, sessile or nearly so, approximate or slightly separate, linear, 1.5-4 cm. long, 4-6 mm. wide, often attenuate at base, the numerous perigynia appressed-ascending; scales obtuse or acutish with broad light-colored center; perigynia 2.5 mm. long, 1.25 mm. wide, pale green, slenderly nerved, densely granular, strongly stipitate, abruptly minutely beaked, the beak dark colored, entire.

Type Locality: Sierra Nevada at Alta and from Lake Tahoe to Bear Valley (Kellogg, Lemmon); Wasatch Mts., Utah (M. E. Jones).

Wet places, Idaho to Colorado, west to Alaska and California. In California it is found in the northern mountains and along the Sierra Nevada to Tulare Co.

Locs.: Lake Tahoe to Bear Valley, *Kellogg;* Mariposa Co., *Congdon;* American River and Slippery Ford, El Dorado Co., *Brainerd;* Johnson Lake, Yosemite, *Congdon;* San Francisco, *Bolander* 2301 (in part); Moraine Lake, Tulare Co., *Dudley* 2211; Grant Park, *Dudley* 1213; Westons, Tulare Co., *Dudley* 1393; Jacksons Lake, Siskiyou Co., *Dudley;* Snowy Cascade, El Dorado Co., *Brainerd* 77; North Fork, *Griffiths* 4572; Three Rivers, Tulare Co., *Dudley* 2803; Giant Forest, Tulare Co., *Dudley* 2989, 3005.

Bolander 2301 from San Francisco may be a case of a misplaced label. *Carex comosa* Boott was also distributed under the same number and from the same station.

Refs.: Carex Kelloggii W. Boott in S. Wats. Bot. Cal. 2: 240 (1880); Kük. in Engler, Pflzr. 4[20]: 308 (1909). "*C. decidua* Boott" W. Boott in S. Wats. Bot. Cal. 2: 241 (1880). "*C. lenticularis* Michx." W. Boott, l. c. 242, in part. *C. acuta* L. var. *pallida* Boott, Ill. Car. 4: 166, pl. 554 (1867), type from Oregon, Lyall. "*C. vulgaris* var. *juncella* Fries" Olney in Bot. King 368 (1871). "*C. aquatilis* Wahl." F. Kurtz in Engler's Bot. Jahrb. 19: 417 (1894). *C. vulgaris* Fries var. *lipocarpa* Holm, Am. Jour. Sci. (4) 17: 308 (1904), in part, type not definitely designated. *C. limnæa* Holm, Am. Jour. Sci. (4) 20: 301, f. 1-3 (1905), type from Crater Lake, Oregon, *Coville* 1456. *C. Hindsii* C. B. Clarke var. *brevigluma* Kük. in Engler, Pflzr. 4[20]: 307 (1909), type from Lake Pend d' Oreille, Idaho, *Sandberg* 933. *C. lenticularis* Michx. var. *paullifructus* Kük., l. c. 308, type from Palouse Creek, Washington, *Elmer* 881.

103. C. sitchensis Prescott. Densely cespitose from elongated rootstocks, the culms 6-12 dm. high, stout, sharply triangular, strongly reddened at base, phyllopodic, the sheaths smooth, not filamentose, the upper and lower leaves with well developed blades, the middle ones shorter; blades flat or channeled at base, 2-9 mm. wide; staminate spikes 2-5, slender; pistillate spikes 3-5, strongly separate, on long slender peduncles, linear-cylindric, 3-9 cm. long, 4.5-6 mm. wide, very many-flowered; scales lanceolate, sharp-pointed, brownish with lighter center, the apex often noticeably hyaline in age; perigynia ovate or oval, 3-3.5 mm. long, 1.5-2 mm. wide, broadest near middle, obscurely nerved, substipitate, puncticulate, greenish straw-colored, not red-dotted, apiculate.

Type Locality: Sitcha, Alaska.

Near the coast from Prince William Sound, Alaska, to Santa Cruz Co., California; apparently very local in California.

Locs.: Crescent City, Del Norte Co., *Dudley;* Twelve-Mile House near San Jose, *Bolander;* Santa Cruz, *Wood* 599; Clear Creek, Butte Co., *H. E. Brown* 91; Sissons, *Jepson* 55a.

Refs.: Carex sitchensis Prescott, Mem. Acad. St. Petersb. (6) 2: 169 (1832); Kük. in Engler, Pflzr. 4[20]: 348 (1909). "C. *aquatilis* Wahl." W. Boott in S. Wats. Bot. Cal. 2: 241 (1880). *C. Howellii* Bailey, Mem. Torr. Club 1: 45 (1889), type from mouth of Columbia River, Oregon, *Howell. C. dives* Holm, Am. Jour. Sci. (4) 17: 312 (1904), type from Oregon, *Henderson. C. pachystoma* Holm, Am. Jour. Sci. (4) 20: 302, f. 7-8 (1905), type from Crater Lake, Oregon, *Applegate & Coville* 1362. *C. aquatilis* Wahl. var. *dives* Kük. and var. *pachystoma* Kük. in Engler, Pflzr. 4[20]: 311 (1909).

104. C. aquatilis Wahl. Rootstocks slender, sending forth long horizontal stolons, the culms cespitose, 2-7 dm. high, slender, sharply triangular above, reddened at the base; leaf-blades 2-6 mm. wide; staminate spikes 1-2, slender; pistillate spikes 2-4, sessile or short-peduncled, not aggregated, linear, 1.5-6 cm. long, 4-6 mm. wide; scales oblong-obovate to lanceolate, obtuse or acutish, blackish to reddish-brown, 1-nerved or with a lighter center; perigynia elliptic-obovoid, 2.5 mm. long, 1.25 mm. wide, broadest below apex, nerveless but with a median ridge, substipitate, puncticulate, granular, red-dotted, minutely beaked.

Type Locality: "Hab. intra ripas fluviorum per Lapponiam."

Swampy grounds, Quebec to Alaska and south in the western mountains to northern California and New Mexico; widely distributed in northern Eurasia. Abundant in the western mountains east and north of California, but rare in California, where known only from the northeastern portion.

Loc.: Moulton, Warner Mts., *Griffiths & Hunter* 474.

Refs.: Carex aquatilis Wahl. in Vet. Akad. Nya Handl. Stockholm 24: 165 (1803). Not "*C. aquatilis* Wahl." W. Boott in S. Wats. Bot. Cal. 2: 241 (1880). *C. stans* Drejer Revis. Car. Bor. 40 (1841), type from Greenland, *Wahl. C. variabilis* Bailey, Mem. Torr. Bot. Club 1: 18 (1889), type from Colorado, *Vasey* 582.

105. C. barbaræ Dewey. (Fig. 42). Cespitose with long horizontal stolons, the culms 3-10 dm. high, phyllopodic, stout, sharply triangular, serrulate at least in inflorescence; leaves 7-12, the sheaths brownish-puberulent, the middle more or less filamentose, the blades light-green, thick, flat or channeled, 3.5-9 mm. wide, serrulate, the middle ones much reduced; staminate spikes one or two, narrowly linear; pistillate spikes 2-5, sessile or short-peduncled, oblong- or linear-cylindric, 2.5-8 cm. long, 5-8 mm. wide, the very many perigynia ascending; lowest bract shorter than to exceeding inflorescence; scales narrowly ovate, hispid mucronate, occasionally some merely acute, reddish-purple with lighter center and margins; perigynia narrowly to broadly oval, nearly sessile, obscurely nerved on both faces, 3-4.5 mm. long, 2-2.5 mm. wide, slightly serrulate above, straw-color, at length brownish, puncticulate, often granular, the beak 0.5 mm. long, sharply bidentate and hispidulous between teeth.

Type Locality: Santa Barbara, California (Parry).

Southern Oregon, south through California west of the Sierra Nevada (but in the cañons in the foothills), extending as far south as San Bernardino. Erroneously recorded from Utah.

One of the most characteristic Californian species over a large part of the state. The species has usually been known as Carex laciniata Boott, but that name is ante-dated by Dewey's. The name Carex barbaræ also has been variously misapplied to several species like Carex sitchensis Prescott and Carex Schottii Dewey, but Dewey's specimens although very young and poor plainly belong here. The rough mucronate scales and the hispid pubescence between the perigynia teeth are both marked peculiarities of this species.

Fig. 42. Carex barbaræ Dewey.
a, inflorescence, × 2/3; *b*, scale, × 5; *c*, perigynium, × 5.

Locs.: Santa Barbara, *Parry;* Russian River, Sonoma Co., *Bolander* 3866; Mark West Creek, *Bolander;* Arroyo Seco, Santa Lucia Mts., *Brewer* 683; Monterey, *Brewer* 672, 682; Clear Lake, Lake Co., *Bolander* 2609, 2629, 2630; Oakland, *Brewer* 1566 (in part), *Bolander* 27, 1565, 1566*f*, 1567, 2506; San Antonio River, Salinas Valley, *Brewer* 529; Oak Knoll, Los Angeles Co., *Braunton* 799, 802; Berkeley Hills, *Hall, Davy* 4070; Claremont Cañon, Berkeley, *Davy* 4016; Blair Park, Alameda Co., *Davy;* Soquel Creek, Santa Cruz Co., *Davy;* Belmont, San Mateo Co., *Davy* 782; Waterman Cañon, San Bernardino Mts., *Parish* 1053, 2142, 2143, 2185, 8020; Pleasanton, *Lilienthal;* Santa Clara, *Pendleton* 399; Mule Creek, Ione, Amador Co., *Braunton* 1093; Amador Co., *Hansen* 641; Skaggs, Sonoma Co., *Geis* 566; Sebastopol, Sonoma Co., *Heller* 5797; Monterey Co., *Congdon;* Los Angeles Co., *Hasse* 4093; Lake Merced, San Francisco Co., *Elmer* 2958, *Bioletti;* Stanford University, *Baker* 886; Lower Sacramento, *Wilkes* (type of *Carex Wilkesii* Olney); Pasadena, *McClatchie;* Pajaro Valley, *Wood* 543; Bolinas Bay, *Bigelow;* American Fork of Sacramento, *Rich;* Tassajara Hot Spgs., Monterey Co., *Elmer* 3138; Glendale, Los Angeles Co., *Hasse;* Ukiah, *S. A. Barrett;* Stanford University and Black Mt., San Mateo Co., *Dudley;* Pescadero, San Carlos and Crystal

Springs, San Mateo Co., *Dudley;* Lake Merced, San Francisco Co., *Dudley;* Glenwood, Eccles, Big Basin and Santa Cruz, *Dudley;* Kings River, *Dudley;* Carmel-by-the-sea, *A. Randall* 442; Mt. Diablo, *Abrams* 5723; Visalia, *Abrams* 5382; Carmel, *Abrams* 5217; Sissons, *Jepson* 57*a*; Santa Cruz, *M. E. Jones* 2345; Sanger, Fresno Co., *Hudson;* North Fork, *Griffiths* 4138; Ukiah, *McCowen;* Cosumnes River, *Merriam;* Sycamore Creek, Fresno Co., *Merriam;* Stanford University, *Baker* 886; Santa Barbara, *Hitchcock* 112, *Elmer* 3961; Marysville, *Wooton;* Kern Cañon, *Heller* 7773; Santa Cruz Mts., *Hitchcock* 207; Petaluma, *Piper* 6466; Angel Isl., *Schmitt;* Jamacha, San Diego Co., *Chandler* 5262; Pine Ridge Mt., Santa Clara Co., *Abrams* 6651; Sonoma, *Kuhn;* Berkeley Hills, *Jepson* 4172.

Refs.: Carex barbaræ Dew. Bot. Mex. Bound. 231 (1858). *C. laciniata* Boott in Benth. Pl. Hartweg 341 (1857), name only; Ill. Car. 4: 175, pl. 594 (1867), in part; type from banks of Sacramento, *Hartweg* 2022; W. Boott in S. Wats. Bot. Cal. 2: 243 (1880); Parish, Bull. S. Cal. Acad. 4: 84 (1905); Kük. in Engler, Pflzr. 4[20]: 366 (1909). *C. Wilkesii* Olney, Bot. Wilkes Exped. 2: 477, pl. 17 (1874), type from banks of Sacramento, *Wilkes. C. lacunarum* Holm, Am Jour. Sci. (4) 17: 303, f. 12-13 (1904), type from Sebastopol, *Heller* 5797. *C. magnifica* Dewey var. *lacunarum* Kük. in Engler, Pflzr. 4[20]: 366 (1909). "*C. nudata* W. Boott var. *anomala* Bailey" Kük. l. c. 337, as to California specimens. "*C. Prescottiana* Boott" Olney in Bot. King 369 (1871) in part.

106. C. Schottii Dewey. Culms stout, aphyllopodic, in large clumps, 10-15 dm. high, sharply triangular and very rough above; leaf-blades flat with revolute margins, 6-12 mm. wide, serrulate, the lower sheaths strongly yellowish-brown tinged, sharply keeled and hispidulous dorsally, the ventral side very fragile, breaking and becoming filamentose; staminate spikes about 3, elongate linear, 8-14 cm. long, 4 mm. wide; pistillate spikes (usually staminate above) mostly 3, sessile or nearly so, more or less strongly separate, erect, elongate linear, 11-14 cm. long, 5-6 mm. wide, the perigynia appressed-ascending, very numerous, closely packed in several ranks; lowest bract usually exceeding culm; scales narrowly lanceolate, acute or obtusish, purplish-black with broad 3-ribbed lighter center, usually exceeding perigynia; perigynia plano-convex, membranaceous, obovate, 3 mm. long, 1.75 mm. wide, greenish straw-colored, very minutely granular, strongly several nerved on both faces, round tapering and sessile at base, rounded at apex and abruptly minutely beaked, the beak 0.25 mm. long, with submarginate orifice.

Type Locality: Santa Barbara (Parry).

Southern California from Monterey Co. to San Diego Co. and eastward into the San Bernardino Mts. below 2500 feet.

Locs.: Santa Barbara, *Parry;* Pasadena, *Geo. B. Grant* 137, 137*a*, 3592; Oak Knoll, Los Angeles Co., *Geo. B. Grant* 5347, *Braunton* 798; San Bernardino, *Parish* 6056, 5981, 2145; Los Angeles Co., *Hasse, Davidson* 2, *Abrams* 200; San Bernardino Mts., *Parish* 3279, 3276; Waterman Cañon, *Parish* 2144; Orange Co., *Geis* 500; Santa Ana, *Geis;* Laguna, *Schoenefeldt* 3689; Castroville, Monterey Co., *Elmer* 4386; "Southern California," *Parry & Lemmon* 397, *Fremont* 346; Pasadena, *McClatchie.*

Refs.: Carex Schottii Dew. Bot. Mex. Bound. 231 (1858); W. Boott in S. Wats. Bot. Cal. 2: 244 (1880); not Kük. in Engler, Pflzr. 4[20]: 365 (1909). "*C. Barbaræ* Dewey" Parish, Bull. S. Cal. Acad. 4: 108, pl. 14 (1905).

One of the largest species of Carex and remarkable for its very long narrow pistillate spikes. The original specimens are extremely young and fragmentary, but are unmistakable after one has become acquainted with the species.

107. C. senta Boott. Loosely cespitose and stoloniferous, the culms slender, 4-9 dm. high, sharply triangular and rough on the angles, biennial, brownish at base; leaves 6-12, the middle sheaths sparingly hispidulous dorsally and filamentose ventrally, the blades flat or slightly revolute, 3-5 mm. wide, serrulate above, the middle ones much reduced, the lower and upper 1-4 dm. long; terminal spike staminate, peduncled, 3-4.5 cm. long, with 1-2 smaller ones at its base; pistillate spikes 1-3, sessile or short-peduncled, 2.5-5 cm. long, 5-9 mm. wide, the very numerous perigynia ascending; lower bract shorter than to exceeding inflorescence; scales oblong-ovate or lanceolate, obtuse to acuminate, purplish-black with lighter center; perigynia ovate, rounded and sessile at base, conspicuously several nerved on both faces, green or straw-colored, often dark-tinged and frequently strongly red-dotted,

granular, punctieulate, round tapering at apex, abruptly minutely beaked, the beak 0.25 mm. long with entire orifice.

Type Locality: Santa Inez Mts., twenty miles northeast of Santa Barbara, California, (Brewer 350).

Coastal counties from Alameda Co. to San Diego Co., in the southern mountains and in the Sierra Nevada as far north as Amador Co. Also extending eastward into Arizona.

Locs.: Santa Inez Mts., *Brewer* 350; San Fernando, *Brewer* 218; Bear Valley, San Bernardino Mts., *Abrams* 2855, 2852, 1343, *Parish* 3278, 1782, 1576; San Jacinto Mts., *Hasse, Reed* 2558, *Hall* 2338, 2483, *C. M. Wilder* 916*a*; San Bernardino Mts., *Parish* 3702 (in part), 5031; Vivian Creek, Mt. San Gorgonio, *Geo. B. Grant* 6406; High Creek, *Geo. B. Grant* 6436; Mill Creek Falls, *Parish* 2485; Whitewater Basin, *Wilder;* Deep Creek, San Bernardino Mts., *Geo. B. Grant;* Santa Paula, Ventura Co., *Cobb* 135; Santa Barbara, *Bolander;* Laguna, *Schoenefeldt* 3594; Oakland, *Bolander* 1566*d*, *o*, *e*, *s*, *p* (salt-marsh); Los Angeles, *Bigelow;* Santa Barbara, *Parry, Elmer* 3961; Yosemite, *Bolander* 6212 (in part), *Abrams* 4625, *Bioletti* 4, *Torrey;* Amador Co., *Hansen* 636; Mariposa, *Congdon;* Stockton Creek, Mariposa Co., *Congdon;* Clarks, Yosemite, *Bolander* 6206, 6208, 6212; Coyote Creek, Santa Clara Co., *Dudley* 4156; Embareadero Road, Santa Clara Co., *Dudley;* Stanford University, *Scofield;* Nacimiento Creek, Gold Creek and Carmel River, Monterey Co., *Dudley;* Laguna, San Diego Co., *Schoenefeldt* 3594; Ojai ranch, *Peckham;* Yosemite, *Brewer* 1648 (in part); Giant Forest, Tulare Co., *Dudley* 2996, 2999; Kaweah River, *Dudley*.

Refs.: Carex senta Boott, Ill. Car. 4: 174 (1867); W. Boott in S. Wats. Bot. Cal. 2: 242 (1880); Parish, Bull. S. Cal. Acad. 4: 106, pl. 20 (1905); Kük. in Engler, Pflzr. 4^{20}: 333 (1909). *C. auriculata* Bailey, Mem. Torr. Club 1: 19 (1889); type from Coloma, Cal., *Andersson;* Parish, Bull. S. Cal. Acad. 4: 108 (1905). *C. austromontana* Parish, Bull. S. Cal. Acad. 4: 108, pl. 15 (1905), type from San Bernardino Mts., *Parish* 2485. "*C. Jamesii* Torr." W. Boott in S. Wats. Bot. Cal. 2: 243 (1880), in small part. *C. Bishallii* C. B. Clarke, Kew Bull Misc. Inf. Add. Ser. 8: 70 (1908), type from Yosemite, *Brewer* 1648. *C. nudata* W. Boott, f. *firmior* Kük. in Engler, Pflzr. 4^{29}: 337 (1909), type from Arizona *Palmer* 546 and f. *sessiliflora* Kük., l. e., type from Amador Co., Cal., *Hansen* 636. "*C. nudata* W. Boott Kük., l. e. in part. *C. Jamesii* Torr. var. *austromontana* Kük. in Engler, Pflzr. 4^{20}: 318 (1909). *C. Jamesii* var. W. Boott in S. Wats. Bot. Cal. 2: 243 (1880). "*C. angustata* Boott" W. Boott, l. e. 242, in part.

108. C. nudata W. Boott. Extremely densely cespitose, the rootstocks descending obliquely, the stolons slender, little developed, the culms slender, 3-8 dm. high, sharply triangular, somewhat roughened above, strongly dark purplish at base; leaf-blades light green, flat with revolute margins, 2.5-3.5 mm. wide, very smooth, except on margins above and toward apex, the basal sheaths filamentose, rounded and hispidulous dorsally; staminate spike short-peduncled, 1.5-3 cm. long; lateral spikes 3-5, sessile or short-peduncled, 1-4 cm. long, 6-7 mm. wide, the numerous perigynia ascending; lowest bract shorter than culm, the upper ones very short, conspicuously bi-auriculate; scales ovate, or oblong-ovate, obtuse or acutish, much exceeded by perigynia, blackish with lighter midvein; perigynia lanceolate or ovate, compressed biconvex, 3-4 mm. long, 1.5 mm. wide, finely 6 9 nerved on both faces, membranaceous; greenish straw-color or purplish-black tinged, smooth or slightly granular at apex, rounded and substipitate at base, the upper portion empty, abruptly minutely beaked, the beak 0.25 mm. long, entire.

Type Locality: "In the Coast Ranges from San Francisco Bay to Ukiah," (Bolander 121, 2299, 3836, 4638, 6202).

Rocky beds of streams in the northern counties extending south in the Coast Ranges to Santa Clara Co. and in the Sierra Nevada to Calaveras Co.; also in western Oregon.

Locs.: Oakland, *Bigelow;* Mark West Creek, Sonoma Co., *Bolander* 3812; Oakland Slough, *Bolander* 6202; Ukiah, *Bolander* 3836, 4638; Russian River, Sonoma Co., *Bolander* 3866; Marin Co., *Bolander* 2299; Redwood Belt, Humboldt Co., *Chandler* 1235; Carlotta, Humboldt Co., *Tracy* 4654; Stuart, Trinity Co., *Yates* 518; Alder Point, Humboldt Co., *Tracy* 1885; Little River, Humboldt Co., *Tracy* 3220, 3221; Stanford University, *Abrams* 2433; Comptche, Mendocino Co., *McMurphy* 432; Klamathon, *Copeland* 3541; Sulphur Creek, Sonoma Co., *Geis* 564; Adobe Cañon, Sonoma Co., *Bioletti;* High Valley Creek, Lake Co., *Bowman* 111; "California," *Kellogg & Harford* 1075; Stirling, Butte

Co., *Heller* 10818; San Francisquito Creek, San Mateo Co., *Davis;* Gilroy Hot Spgs., Santa Clara Co., *Dudley;* Iversons, San Mateo Co., *Dudley;* Calaveras Big Trees, *Dudley;* Eel River, Humboldt Co., *Dudley;* Castle Rock, Sacramento River, *Goldsmith* 3; "California," *R. M. Austin* 764; San Jose, *J. R. Bush;* Clear Creek, Butte Co., *H. E. Brown* 176; Clinton, Amador Co., *Hansen* 1658; Loma Prieta, Santa Clara Co., *Dary* 572; Burney Falls, Shasta Co., *Dudley.*

Refs.: Carex nudata W. Boott in S. Wats. Bot. Cal. 2: 241 (1880); Kük. in Engler, Pflzr. 4[20]: 337 (1909). "*C. decidua* Boott" Boott in Pac. R. Rep. 4: 153 (1857). "*C. angustata* Boott" W. Boott in S. Wats. Bot. Cal. 2: 242 (1880), in part. *C. Hallii* Bailey, Proc. Am. Acad. 22: 82 (1886) (not Olney 1871), type loc. Oregon, *Hall* 594; Kük. in Engler, Pflzr. 4[20]: 333 (1909). "*C. elata* All." Olney, Proc. Am. Acad. 8: 407 (1872). "*C. decidua* Boott" Olney, l. c. *C. pulchella* Holm, based on *C. Hallii* Bailey, Am. Jour. Sci. (4) 16: 457 (1903), not Berggr. (1878). "*C. acuta* L." Bailey, Proc. Am. Acad. 22: 86 (1886). *C. acutina* Bailey, Mem. Torr. Club 1: 52 (1889), type from Deschutes River, Ore., *Howell* 935.

Very closely resembling in its densely cespitose method of growth the eastern *Carex stricta* Lam. Kükenthal's description in the Pflanzenreich (4[20]: 337) is to a considerable extent based on a loosely cespitose species (*C. senta* Boott) which replaces the present species farther south. Good herbarium specimens of *Carex nudata* showing its characteristic habit of growth are a rarity.

109. C. eurycarpa Holm. Loosely cespitose and long stoloniferous from creeping rootstocks, the culms aphyllopodic, 4-9 dm. high, slender, sharply triangular, roughened above; leaves several to a culm, the blades flat with revolute margins, 3-4.5 mm. wide, roughened toward apex, the lower sheaths minutely hispidulous and rounded dorsally, olive tinged ventrally, sparingly filamentose; staminate spike more or less peduncled, usually 3-4 cm. long; lateral spikes 3-5, the upper often staminate above, sessile or short-peduncled, 2-4 cm. long, 4-6 mm. wide, the numerous perigynia appressed; lowest bract usually exceeding culm; scales lanceolate, short acuminate, purplish-brown with prominent light midvein; perigynia broadly obovate, 2.75 mm. long, 2 mm. wide, several-nerved on both faces, puncticulate, minutely roughened, greenish or straw-color, rounded and substipitate at base, and rounded and abruptly minutely beaked at apex, the beak 0.5 mm. long, emarginate.

Type Locality: Falcon Valley, west Klickitat Co., Washington (Suksdorf 1284, 2962).

Boggy meadows from Washington to northern California and south in the Sierra Nevada to Mariposa Co.

Locs.: Devils Lake, Mariposa Co., *Congdon;* Mill Creek, Mt. Lassen, *Hall & Babcock* 4310; Goosenest foothills, Siskiyou Co., *Butler* 855; Prattville, Plumas Co., *Heller & Kennedy* 8784; Plumas Co., *Ames;* Black Fox Mts., Siskiyou Co., *Dudley;* Squaw Valley, Placer Co., *L. S. Smith* 559, 561, 562 (in part); Mrs. Watson's Meadow, El Dorado Co., *Brainerd* 42 and 49; Tallac, El Dorado Co., *Brainerd* 46; Truckee, *Hitchcock* 340; Sissons, *Dudley, L. E. Smith* 691; Mt. Shasta, *Dudley.*

Refs.: Carex eurycarpa Holm, Am. Jour. Sci. (4) 20: 303 (1905); Kük. in Engler, Pflzr. 4[20]: 339 (1909).

110. C. oxycarpa Holm. Loosely cespitose and long stoloniferous from creeping rootstocks, the culms aphyllopodic, 4.5-9 dm. high, slender, sharply triangular, slightly roughened above; leaves 3-4 to a culm, the blades flat with revolute margins, 2-3 mm. wide, roughened toward apex, the lower sheaths hispidulous and scarcely carinate dorsally and light brownish ventrally; terminal spike staminate, stalked; lateral spikes 4-5, the upper 1-2 staminate, the lower 2-4 pistillate or androgynous, sessile or short-peduncled, 2.5-4.5 cm. long, 5 mm. wide, the perigynia numerous, appressed-ascending; lowest bract exceeding inflorescence; scales lanceolate, acute, purplish-black with light midvein; perigynia obovate, 3.5 mm. long, 1.5 mm. wide, 3-5-striate on both faces, granular roughened, brownish, rounded and substipitate at base, and rounded and abruptly minutely apiculate at apex, the orifice entire.

Type Locality: West Klickitat Co., Washington (Suksdorf 816).

Wet meadows from northern California to Washington and east to Idaho. In California it is confined to the northern part of the Sierra Nevada, where it is known as far south as Butte Co.

Locs.: Morgan, Tehama Co., *Hall & Babcock* 4347; Sissons, *Brainerd;* Jonesville, Butte Co., *Hall* 9783.

Refs.: Carex oxycarpa Holm, Am. Jour. Sci. (4) 20: 303 (1905). *C. eurycarpa* Holm, var. *oxycarpa* Kük. in Engler, Pflzr. 4[20]: 339 (1909). *C. egregia* Mackenzie, Bull. Torr. Club 42: 414 (1915), type from Falcon Valley, Washington, *Suksdorf* 5181.

XXIX. Cryptocarpæ Tuckerm. Stoloniferous. Culms aphyllopodic or phyllopodic. Terminal 1-2 spikes staminate, linear, the others pistillate, linear or oblong, closely many or very many-flowered, the lower or all peduncled, and erect or very often pendulous. Bracts sheathless, the upper at least biauriculate at base. Scales 3-nerved, usually cuspidate or aristate, but in some species obtuse. Perigynia coriaceous or membranaceous, plano- or bi-convex or turgid, elliptic to obovate, puncticulate, margined, abruptly minutely beaked or beakless, the orifice entire or nearly so. Achenes lenticular, apiculate, constricted in the middle. Style straight, slender, jointed with achene, at length deciduous. Stigmas 2.

111. C. Lyngbyei Hornem. Strongly long stoloniferous, the culms varying from rather slender to very stout, 3-9 dm. high, the lowermost leaves (of first year's growth) with very long blades, the lower on the second year's growth with shorter blades than the upper; leaf-blades flat, 2-12 mm. wide; uppermost spike staminate, long-peduncled; lateral spikes 2-6, the upper one or two often staminate or androgynous, the lower pistillate, drooping on slender, smooth peduncles, densely many-flowered, linear or oblong, 2-8 cm. long, 5-10 mm. wide; bracts leaf-like, exceeding culms; perigynia oblong-oval, bi-convex, 2.5-3 mm. long, more or less nerved, straw-colored, puncticulate, very minutely beaked.

Type Locality: Faroe Islands, Europe.

Pacific sea coast from northwestern California to the Aleutian Islands and south on the Asiatic coast to Japan and Manchuria; also known from Greenland, Iceland and northern Europe. In California known only from the coast of Humboldt Co.

Loc.: Humboldt Bay, *Tracy* 3149, 4646.

Refs.: Carex Lyngbyei Hornem. Fl. Dan. pl. 1888 (1827); Kük. in Engler, Pflzr. 4[20]: 363 (1909). *C. cryptocarpa* C. A. Meyer, Mem. Acad. St. Petersb. 1: 226, pl. 14 (1831), type from Unalascha and Kamtschatca. *C. Scouleri* Torr. Ann. Lyc. N. Y. 3: 399 (1836), type from Observatory Inlet, west shore of America. *C. filipendula* Drejer, Rev. Crit. Car. 46 (1841), type from Iceland. *C. romanzowiana* Cham. ex. Steud. Synops. Cyper. 216 (1855), type from Unalaschka. *Chamisso. C. Macounii* A. Bennett in Macoun. Cat. Canad. Pl. 4: 147 (1888), type from Vancouver Isl., *Macoun. C. salina* Wahl. var. *robusta* Bailey, Bot. Gaz. 13: 87 (1888), type from Vancouver Isl., *Macoun. C. qualicumensis* Bailey, Bull. Torr. Club 20: 428 (1893), type from Vancouver Isl., *Macoun.*

112. C. obnupta Bailey. (Fig. 43). With long stout stolons, the culms 5-15 dm. high, sharply triangular, roughened above; leaves 5-10, clustered near the base, the blades 5-8 mm. wide, thick, much roughened above; staminate spikes 2-3, linear; pistillate spikes 2-4, oblong to linear-cylindric, 3-10 cm. long, 4-8 mm. wide, many-flowered, the upper sessile or nearly so, the lower more or less strongly peduncled; bracts exceeding culms; scales narrowly ovate, blackish, sharp-pointed, concealing perigynia; perigynia coriaceous, 3-3.5 mm. long, 1.5-2 mm. wide, abruptly minutely beaked, the beak entire or nearly so.

Type Locality: San Mateo Co., California (Kellogg).

FIG. 43. CAREX OBNUPTA Bailey.

a, inflorescence, × 2/3; *b*, scale, × 5; *c*, perigynium, × 5.

Coastal counties from Monterey Bay, California, north to Vancouver and British Columbia.

Locs.: Lorin, Alameda Co., *Davy;* San Francisco, *Bolander* 1566 (in part), 2302, 2529, *Congdon, Wilkes* 1521, *Brewer* 1570; Lake Earle, Del Norte Co., *Davy;* Olema, Marin Co., *Davy* 709; Humboldt Bay, *Chandler* 1122; Pt. Bonita, Marin Co., *Michener & Bioletti;* Eureka, *Dudley, Tracy* 1193, 2546, 3161; Humboldt Bay, *Tracy* 2459, 3701, 3702; Buck Mt., Humboldt Co., *Tracy* 3898; Big River, Mendocino Co., *McMurphy* 433; Fort Point, *Bolander* 1566, 1570, *Congdon;* Sebastopol, Sonoma Co., *Congdon;* Pescadero, San Mateo Co., *Dudley;* Sherwood Valley, Mendocino Co., *Dudley;* Trinidad, Humboldt Co., *Abrams* 6083; Crescent City, Del Norte Co., *Dudley;* Santa Cruz, *Dudley, Thompson;* Mendocino, *Pringle;* Eel River, *Kellogg & Harford* 1077; Santa Lucia Mts., *Plaskett* 42; Tomales Bay, *Bigelow;* Ft. Bragg, Mendocino Co., *Monnet* 692; Berkeley, *Davy;* Eel River, Humboldt Co., *Tracy* 4696; Abbotts Lagoon, Pt. Reyes, *Jepson* 1170; Sycamore Slough, Colusa Co., *Ferris* 607.

REFS.: CAREX OBNUPTA Bailey, Proc. Cal. Acad. (2) 3: 104 (1891). "*C. aquatilis* Wahl." W. Boott in S. Wats. Bot. Cal. 2: 241 (1880). "*C. sitchensis* Prescott" Boott in Hook. Fl. Bor. Am. 2: 220, pl. 221 (1840); W. Boott in S. Wats. Bot. Cal. 2: 243 (1880). *C. magnifica* Dewey, ex. Holm, Am. Jour. Sci. (4) 17: 316 (1904), type from Columbia River; Kük., in Engler, Pflzr. 4[20]: 365 (1909). "*C. Schottii* Dewey" Kük., l. c.

XXX. TRACHYCHLÆNÆ Drejer. Phyllopodic. Culms very stout, leafy below, the lower sheaths strongly filamentose ventrally. Spikes numerous, the upper 3-6 staminate, elongated, the lower 3-6 pistillate (or staminate at apex), linear-cylindric, densely very many-flowered, the lower at least long-peduncled. Lowest bract about equaling or exceeding the inflorescence, short-sheathing. Pistillate scales mucronate or aristate. Perigynia obovoid or oblong, glabrous, roughened or hispidulous, membranaceous, slightly inflated, apiculate-beaked, the orifice emarginate. Achene triangular, the sides flat or slightly concave, continuous with the indurated persistent style. Stigmas 3.

113. C. spissa Bailey. (Fig. 44). Rootstocks stout, woody, the culms very stout, 10-18 dm. high, obtusely triangular, smooth; leaves clustered above base, the blades glaucous green, 7-14 mm. wide, flat with revolute strongly serrulate margins, the sheaths brownish tinged and strongly filamentose ventrally; staminate spikes 3-6, 4-10 cm. long; pistillate spikes 3-6, staminate at apex, approximate or more or less separate, erect, sessile or nearly so, linear-cylindric, 6-14 cm. long, 7-10 mm. wide, the 150-300 perigynia appressed-ascending or at length spreading; scales narrowly ovate, serrulate awned, light brownish with green center and hyaline margins; perigynia obovoid, flattened triangular, 3-4.5 mm. long, light green, very obscurely nerved, membranaceous, tapering at base, very abruptly beaked, the beak 0.5 mm. long, emarginate; style very strongly bent and twisted.

Type Locality: San Diego Co., California (Pringle).

Banks of streams at low altitude from Los Angeles Co. southward into Lower California.

Locs.: Lakeside, San Diego Co., *Brandegee;* San Diego Co., *Pringle;* Glendale, Los Angeles Co., *Hasse;* Spring Valley, San Diego Co., *Stokes;* Mt. Wilson, *Davidson;* Santa Monica Cañon, *Barber* 795; San Luis Rey River, San Diego Co., *Parish* 4459; Jamul Valley, *Schoenefeldt* 3820; Tecate River, *Mearns* 3787; Pasadena, *McClatchie.*

Refs.: Carex spissa Bailey, Proc. Amer. Acad. 22: 70 (1886); Parish, Bull. S. Cal. Acad. 4: 80 (1905); Kük. in Engler, Pflzr. 4^{20}: 422 (1909).

XXXI. Hirtæ Tuckerm. Culms stout, leafy. Rootstocks with long stolons. Leaves septate-nodulose. Spikes 3-10, the upper 1-5 staminate, slender, the others pistillate, many-flowered, erect. Bracts leaflike, equaling or exceeding the culm, often sheathing. Pistillate scales ovate or lanceolate, acute or aristate. Perigynia mostly ascending, coriaceous, ovoid or oblong-ovoid, somewhat inflated, nearly orbicular in cross-section, many-nerved, often hairy, round tapering at the base, tapering into the bidentate beak. Achenes triangular, often stipitate, the sides flat or deeply concave, apiculate, continuous or in some species jointed with the straight or slightly flexuous or very abruptly bent style. Stigmas 3.

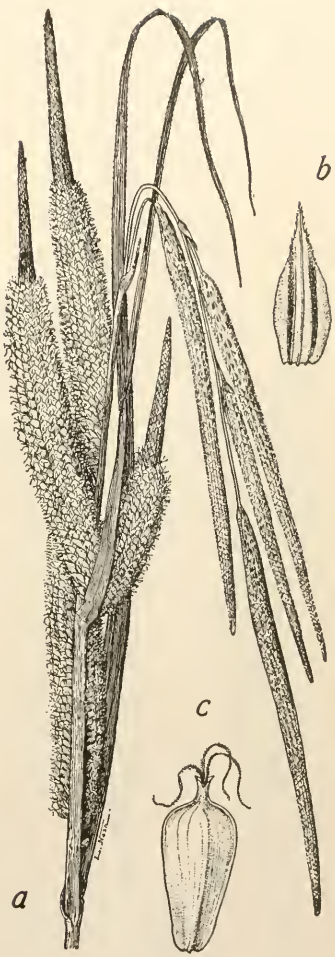

Fig. 44. Carex spissa Bailey.

a, inflorescence, × 2/3; *b*, scale, × 6; *c*, perigynium, × 6.

114. C. yosemitana Bailey. (Fig. 45.) Cespitose from stout rootstocks, the culms 3-9 dm. high, sharply triangular, much exceeding leaves; foliage softly pubescent, the blades not rigid, flat with revolute margins, 3-7 mm. wide; terminal

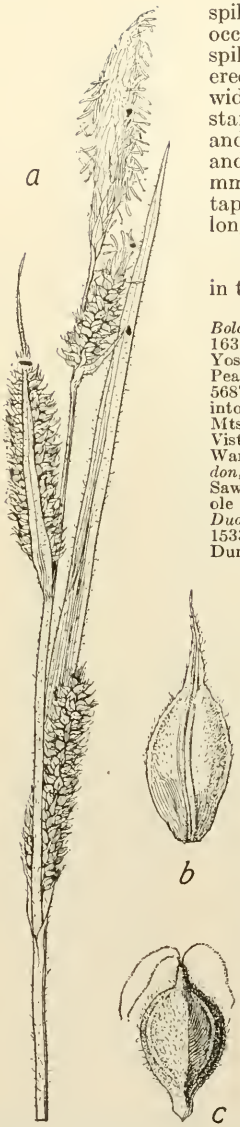

FIG. 45. CAREX YOSEMITANA Bailey.

a, inflorescence, × 1; *b*, scale, × 7; *c*, perigynium, × 7.

spike linear, 12-25 (or 30) mm. long, more or less peduncled, occasionally with a few perigynia, the scales ciliate; pistillate spikes 3-4, more or less separate, sessile or slightly peduncled, erect, oblong-cylindric, 12-20 (or 30) mm. long, 4.5-6 mm. wide, closely flowered, with 40-200 appressed perigynia, often staminate at apex; scales lance-ovate, sharp pointed, ciliate and pubescent, chestnut-brown with 3-nerved green center and hyaline margins; perigynia 3-3.5 mm. long, 1.25-1.50 mm. wide, obovoid, or oblong-obovoid, obscurely nerved, tapering at base, abruptly short-beaked, the beak 0.5 mm. long, obliquely cut, at length bidentulate.

TYPE LOCALITY: Yosemite, California (Brewer 1636).

Sierra Nevada from Tuolumne Co. to Tulare Co., and in the San Jacinto Mts. in Riverside Co.

Locs.: Big Tree Grove, *Bolander* 6221; Yosemite, *Brewer* 1636, *Congdon*, *Dudley*; Little Yosemite, *Jepson* 4395; Sawtooth Peak, Tulare Co., *Hall & Babcock* 5687; Strawberry Creek, San Jacinto Mts., *Wilder* 918; San Jacinto Mts., *Parish* 1574, *Reed;* Mt. Buena Vista, Mariposa Co., *Congdon;* Mt. Warren Pass, Tuolumne Co., *Congdon;* Mt. Silliman, *Dudley* 1504; Sawtooth, *Dudley* 1616, 1617; Oriole Lake, *Dudley;* Kaweah region, *Dudley* 1261; Alta Peak, *Dudley* 1533; Coyote Pass, *Copeland* 29; Dunlap, *Griffiths* 4682.

REFS.: CAREX YOSEMITANA Bailey, Mem. Torr. Club 1: 8 (1889); Parish, Bull. S. Cal. Acad. 4: 68 (1905); Kük. in Engler, Pflzr. 4[20]: 744 (1909). *C. Sartwelliana* Olney, Proc. Am. Acad. 7: 396 (1868), not *C. Sartwellii* Dewey 1842; W. Boott in S. Wats. Bot. Cal. 2: 249 (1880). *C. Congdonii* Bailey Bot. Gaz. 21: 6 (1896), type loc. Mt. Warren Pass, Tuolumne Co., Cal., *Congdon;* Kük. in Engler, Pflzr. l. c.

115. C. oregonensis Olney. (FIG. 46). Rootstocks slender, woody, creeping; culms 1.5-4 dm. high, rigid, smooth, sharply angled, the basal sheaths sparingly reddish-purple; leaves clustered toward base, the blades thick, and rigid, glabrous, 3-5 mm. wide, canaliculate, mostly exceeding culms; terminal 2-3 spikes staminate, linear, 8-16 mm. long; pistillate spikes 3-4, 1.5-4.5 cm. long, 4.5-6 mm. wide, approximate

FIG. 46. CAREX OREGONENSIS Olney.

a, inflorescence, × 1; *b*, scale, × 8; *c*, perigynium, × 8.

or the lower more or less separate, closely erect, closely flowered above or loosely below, the peduncles little exserted, the 20-40 perigynia appressed-ascending; lowest bract exceeding culm; scales ovate, acute to cuspidate, with hyaline margins and 3-nerved green center and chestnut brown between; perigynia ovoid, obtusely triangular, 4-5 mm. long, 2-2.5 mm. wide, densely short pubescent, rounded at base, tapering into a bidentate beak ⅓-½ length of body, the teeth 0.5 mm. long.

Type Locality: Oregon (Elihu Hall).

Mountain meadows from southern Washington to extreme northern California, where recently collected in Siskiyou Co.

Loc.: Medicine Lake, Siskiyou Co., *Goldsmith* 2929*a*.

Refs.: Carex oregonensis Olney, Proc. Am. Acad. 8: 407 (1872); Kük. in Engler, Pflzr. 4[20]: 745, fig. 127 (1909). *C. Halliana* Bailey, Bot. Gaz. 9: 117 (1884) not *C. Hallii* Olney (1871), type from Oregon, *Hall*.

116. C. lanuginosa Michx. (Fig. 47). Rootstocks stout, long-creeping; culms stoutish, more or less reddened at the base, 6-9 dm. high, sharp-angled and rough above; leaf-blades flat, 2-4 mm. wide, rough, the basal sheaths filamentose; staminate spikes 1-3, 3-4 mm. wide, up to 3 cm. long, distant; pistillate spikes 1-3, oblong-cylindric, 1-5 cm. long, 5-7 mm. wide, sessile or short-peduncled, closely flowered, with 25-50 perigynia; lowest bract usually exceeding the culm; scales lanceolate, acuminate or aristate, narrower than and shorter or longer than perigynia, reddish-brown tinged, the margins hyaline; perigynia ovoid, 2.5-3.5 mm. long, 2 mm. wide, densely pubescent, the nerves obscure, rounded at base, abruptly very short beaked, the beak bidentate, the teeth 1 mm. long or less.

Type Locality: "Ad lacus Mistassins," Canada (Michaux).

Swampy places, Nova Scotia to British Columbia, south to District of Columbia, Missouri, New Mexico and southern California. In California it occurs throughout the Sierra Nevada, in the mountains of southern California, and in the northern mountains. This species

Fig. 47. Carex lanuginosa Michx. *a*, inflorescence, × 1; *b*, scale, × 10; *c*, perigynium, × 10.

and Carex rostrata Stokes are the most abundantly collected of all North American species of Carex.

Locs.: Yosemite, *Bolander* 6212 (in part), *Brewer* 1640; Mono Valley, *Brewer* 1814; Mariposa Grove, *Bolander* 4999; Lake Tahoe, *Brainerd;* Truckee River, Nevada Co., *Davy;* Greenfield, Kern Co., *Davy* 1830; Kings River, *Lemmon;* Snow Creek, Mariposa Co., *Congdon;* Donner Lake, *Heller* 6989; Upper Kings Road, *Brewer* 2815; Unio Lake, *Congdon;* Santa Ana, *Geis* 559; San Bernardino Valley, *Parish* 1052, 2085, 2105; Los Angeles, *Davidson;* Chagoopa Creek, *Dudley* 2277; Soda Spgs., *Dudley* 1950; Mt. Whitney, *Dudley* 2509; Hockett Meadow, *Dudley* 1019; Wood, Siskiyou Co., *Dudley;* upper Tuolumne, *Bolander* 5046 (in part); Kennedys Meadow, Tuolumne Co., *A. L. Grant* 222*a*, 167, 223, 446; Sisson, *Dudley, Brainerd;* Jess Valley to Blue Lake, *Griffiths & Hunter* 426; Igerna, Siskiyou Co., *Heller* 8095; Pasadena, *McClatchie;* Victorville, Mojave desert, *Parish* 9705; Victorville, San Bernardino Co., *Johnston* 1781; El Monte, Los Angeles Co., *Johnston;* Squaw Valley, Placer Co., *L. S. Smith* 562 (in part); Lake Tahoe, *L. S. Smith* 640; Stanislaus Forest, *Eggleston* 9508; Upland, *Johnston* 4; Kings River Cañon, *Dudley* 3227; Sisson, *Jepson* 5792.

Refs.: Carex lanuginosa Michx., Fl. Bor. Am. 2: 175 (1803); Parish, Bull. S. Cal. Acad. 4: 67 (1905). *C. pellita* Muhl. in Willd. Sp. Pl. 4: 302 (1805), "Habitat in humidis Pennsylvaniæ." "*C. æmatorhyncha* Desv." Olney, S. Wats. Bot. King 373 (1871). *C. filiformis* L. var. *latifolia* Boeckl. Linnæa 41: 309 (1877); based primarily on *Carex lanuginosa* Michx.; W. Boott in S. Wats. Bot. Cal. 2: 250 (1880). "*C. filiformis* L. var. *æmatorhyncha*" W. Boott in S. Wats. Bot. Cal. 2: 250 (1880). *C. lasiocarpa* Ehrh. var. *lanuginosa* Kük. in Engler, Pflzr. 4[20]: 748 (1909). *C. Watsoni* Olney, S. Wats. Bot. King 370 (1871), type from Carson City, Nevada, *Watson* 1246; W. Boott in S. Wats. Bot. Cal. 2: 244 (1880).

117. C. Sheldonii Mackenzie. Strongly stoloniferous; culms very smooth below the spikes, 6-9 dm. high, neither bright-colored nor fibrillose at the base; leaves about four, the blades 5-6 mm. wide, 2-4 dm. long (or longer on sterile shoots), sparingly short pubescent as are the sheaths, the latter dark-tinged at the mouth, the basal breaking and slightly filamentose; staminate spikes 2-3, distant; pistillate spikes usually 2, 2-5 cm. long, 8-10 mm. wide, rather closely 25-60-flowered; scales ovate-lanceolate, acuminate or cuspidate; perigynia 5-6 mm. long, short-pubescent, the beak bidentate, the teeth less than 1 mm. long.

Type Locality: Clarks Creek, Oregon (Sheldon 8854).

Swamps, Idaho to Oregon and northeastern California.

Loc.: Jess Valley to Blue Lake, *Griffiths & Hunter* 429.

Ref.: Carex Sheldonii Mackenzie, Bull. Torr. Club 42: 618 (1915).

XXXII. Extensæ Fries. Culms slender, but strict, obtusely triangular, leafy toward the base. Leaves sparingly septate-nodulose, the blades narrow. Spikes 2-10, the terminal usually staminate, the others pistillate, suborbicular to oblong, densely flowered, 3 cm. or less long, the upper sessile and approximate, the lower remote, peduncled, erect. Bracts leafy, more or less sheathing. Pistillate scales ovate, mostly reddish, copper or chestnut tinged. Perigynia ascending, spreading or deflexed, membranaceous, smooth, many-nerved, somewhat inflated, obscurely triangular, rounded at the base, contracted into a bidentate beak, the teeth very erect. Achenes triangular with flat sides, jointed with the very slender straight or flexuous style. Stigmas 3.

118. C. viridula Michx. Densely cespitose, not yellowish-green, the culms 0.7-4 dm. high, smooth, bluntly triangular; leaf-blades 1.5-3 mm. wide, canaliculate, the sheaths not prolonged at mouth; staminate spike sessile or short-peduncled; pistillate spikes 2-10, aggregated or the lower separate and exsert-peduncled, 4-12 mm. long, 4-7 mm. wide; scales ovate, much shorter than the perigynia, obtuse or acutish; perigynia 2-3 mm. long, tapering at base, the whitish-tipped beak scarcely ½ length of body.

Type Locality: "Hab. in Canada."

Lake and river banks, Newfoundland to Alaska, south to New Jersey, Indiana, Colorado, Utah and northern California, where known from a single collection in Mendocino Co.

Loc.: Inglenook swamp, Mendocino Co., *Congdon.*
Refs.: Carex viridula Michx. Fl. Bor. Am. 2: 170 (1803). "*C. Oederi* Retz." Schw. & Torr. Ann. Lyc. N. Y. 1: 334 (1825). *C. Urbanii* Boeckl. Bot. Jahrb. 7: 280 (1886), type from southeastern Alaska, *Krause. C. flava* L. var. *recterostrata* Bailey, Bot. Gaz. 13: 84 (1888), type from Vancouver Island, *Macoun. C. flava* L. var. *viridula* Bailey, Mem. Torr. Club 1: 31 (1889). *C. Oederi* Retz. var. *viridula* Kük. and f. *recterostrata* Kük. in Engler, Pflzr. 4^{20}: 674 (1909).

XXXIII. Physocarpæ Drejer. Culms mostly tall and stout, leafy below. Leaves septate-nodulose, not hairy. Spikes 2-10, the upper 1-5 staminate, the others normally pistillate, subglobose to linear-cylindric, generally closely many-flowered, erect, short-peduncled, more or less remote. Bracts leaflike, much exceeding the inflorescence, normally sheathless. Perigynia ascending, spreading or even reflexed, membranaceous, smooth, from little to much inflated, suborbicular in cross-section, coarsely many ribbed or nerveless, contracted into a beak, the beak entire to bidentate. Achenes much shorter than the perigynia, triangular or lenticular, continuous with the usually tortuous style. Stigmas 3 or 2.

119. C. vesicaria L. (Fig. 48). Rootstocks short, creeping and stoloniferous, the culms 3-9 dm. high, acutely angled and rough above, slender to stout, aphyllopodic and purplish tinged at base; leaf-blades 3-6 mm. wide, the sheaths sparingly nodulose dorsally, and usually somewhat breaking and filamentose ventrally; staminate spikes 2-4, linear, 2-4 cm. long, 2.5-4 mm. wide; pistillate spikes 1-3, sessile or short-peduncled, erect, oblong-cylindric, 2.5-7 cm. long, 6-15 mm. wide, more or less strongly separate, many-flowered; lower bracts exceeding culms; scales ovate or lanceolate, acute, acuminate or short-awned, ½ to ⅔ length of perigynia; perigynia 5-8 mm. long, ascending, ovoid, round in cross-section, yellowish-green or darker tinged, 8-10 nerved, the beak smooth, 2 mm. long, the teeth erect, 0.5-0.7 mm. long.

Type Locality: "Habitat in Europæ udis sylvaticis."

Wet meadows and swamps, Quebec to British Columbia, south to Pennsylvania, Ohio and California. In California it extends south in the Coast Ranges to Marin Co. and in the Sierra Nevada to Tulare Co. Very variable.

Locs.: Yosemite, *Brewer* 1654, *Abrams* 4576, *Congdon, Hitchcock, Bolander* 6200 (in part); Spragues River, e. of Klamath Valley, *Hillebrand;* Summit Camp, Sierra Nevada, *Kellogg;* Lake Tenaya Trail, Lake Tenaya and Chilnualna Trail, Mariposa Co., *Congdon;* Donner Lake, *Heller* 6988; Sebastopol, Sonoma Co., *Heller* 5798; Prattville, Plumas Co., *Heller & Kennedy* 8818; Lake Mary, Mono Co., *Congdon;* Sequoia National Park, *Davidson* 2129; Hetch Hetchy, Mariposa Co., *Bioletti;* Egg Lake, Modoc Co., *Baker;* Tomales Bay, Marin Co., *Bolander* 2303; Ostrander's, Sierra Nevada, *Bolander* 6211; Johnson Lake, *Congdon;* Sierra Valley, Sierra Co., *Lemmon;* Benwood Meadow, El Dorado Co., *Heller* 12262; Kern Lakes, Tulare Co., *Dudley* 2045;

Fig. 48. Carex vesicaria L.
a, inflorescence, × ⅔; *b*, scale, × 7; *c*, perigynium, × 7.

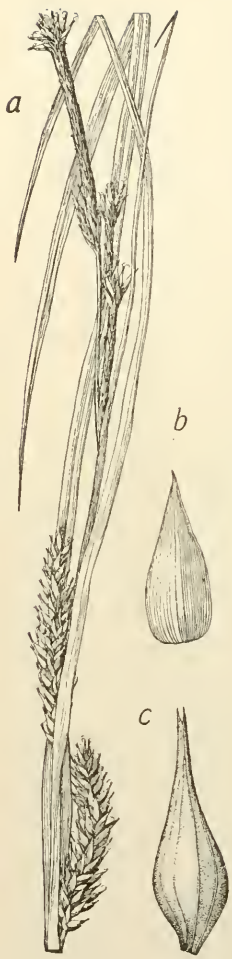

Fig. 49. Carex exsiccata Bailey.

a, inflorescence, × 2/3; *b*, scale, × 4; *c*, perigynium, × 4.

Grant Park, *Dudley* 1203; Medicine Lake, Siskiyou Co., *Goldsmith* 27; Lake Audrain, El Dorado Co., *Brainerd* 12; Truckee, *Hitchcock* 255, 259; Prattville, *M. E. Jones;* Kaweah Meadows, *Purpus* 2097, 5132; Cahto, Mendocino Co., *Bolander* 4689; Nellie Lake, Fresno Co., *A. L. Grant* 1083; Squaw Valley, Placer Co., *L. S. Smith* 567; Goose Valley, Shasta Co., *Baker 5d*; Hetch Hetchy, *Jepson* 3476; Tuolumne Soda Spgs., *Brewer* 1781; South Fork, San Joaquin River, *Hall & Chandler* 625; Summit Camp, *Kellogg;* Sequoia Nat'l Park, *Geo. B. Grant* 1986, 2026; Lake Tahoe, *Geo. B. Grant;* Giant Forest, Tulare Co., *Dudley* 2991; Kings River Cañon, Fresno Co., *Dudley* 3192; Yosemite, *Jepson* 5666; Hetch Hetchy, *Jepson* 4633.

Refs.: Carex vesicaria L. Sp. Pl. 2: 979 (1753); W. Boott in S. Wats. Bot. Cal. 2: 252 (1880), and including var. β Boott and var. γ W. Boott. *C. monile* Tuck. var. *pacifica* Bailey, Proc. Cal. Acad. (2) 3: 105 (1891), type from Yosemite, *Brewer* 1654. *C. monile* Tuck. var. *colorata* Bailey, Mem. Torr. Club 1: 39 (1889), type from Grand Lake, Colorado, *Vasey* 5849. "*C. trichocarpa* Muhl. var. *imberbis* Carey" and "*C. monile* Tuckerm." W. Boott in S. Wats. Bot. Cal. 2: 251 (1880). *C. vesicaria* L. var. *pacifica* Kük. and var. *colorata* Kük. in Engler, Pflzr. 4[20]: 726 (1909). *C. vesicaria* L. var. *obtusisquamis* Bailey, Carex Cat. 4 (1884) and in Bot. Gaz. 9:121 (1884), type from Yosemite, *Brewer* 1781.

120. C. exsiccata Bailey. (Fig. 49). Rootstocks stout, short-creeping, the culms stout, 3-10 dm. high, acutely triangular and rough above, aphyllopodic, more or less purplish tinged at base; leaf-blades 3-6 mm. wide, the sheaths sparingly nodulose dorsally and usually somewhat breaking and filamentose ventrally; staminate spikes 2-4, 2-4.5 cm. long, narrow; pistillate spikes 1-3, sessile or short-peduncled, more or less strongly separate, erect, cylindric, 2-7 cm. long, 10-14 mm. wide, closely many-flowered; lower bracts exceeding culm; scales lanceolate-ovate, sharp-pointed, narrower than and about ½ (rarely ⅔) length of perigynia; perigynia ascending, 7-10 mm. long, lanceolate, little inflated, olive green, 8-10 ribbed, tapering to the beak, the beak 1.5-2 mm. long, smooth, the teeth erect, 0.5 mm. long.

Type Locality: Columbia River (Douglas, Scouler).

Wet places from southern Alaska to middle California east to Montana. In California it is confined to the Coast Ranges from San Mateo Co. northward.

Locs.: Eureka, *Tracy* 1194; Bald Mt., Humboldt Co., *Tracy* 4613; Buck Mt., Humboldt Co., *Tracy* 3397, 3899; Big Basin and Wrights, Santa Clara Co., *Dudley;* Woodside, San Mateo Co., *Dudley;* Ft. Bragg, *Mathews* 21; Tomales Bay, *Bigelow.*

Refs.: Carex exsiccata Bailey, Mem. Torr. Club 1: 6 (1889). *C. vesicaria* L. var. *major* Boott in Hook. Fl. Bor. Am. 2: 221 (1840), type from Columbia River, *Douglas, Scouler*; Kük. in Engler, Pflzr. 4[20]: 726 (1909). *C. vesicaria* L. var. β. Boott, Ill. Car. 4: 162 (1867). *C. vesicaria* L. var. *lanceolata* Olney, Proc. Am. Acad. 8: 407 (1872), type from Oregon, *Hall* 608. *C. vesicaria* L. var. *globosa* Olney, l. c. 480, type from Oregon, *Hall* 609. *C. exsiccata* var. *globosa* Bailey and var. *pungens* Bailey, Mem. Torr. Club 1: 7 (1889). *C. vesicaria* L. var. *major* Boott f. *globosa* Kük. and f. *pungens* Kük. in Engler, Pflzr. 4[20]: 727 (1909).

An apparent hybrid with *C. rostrata* Stokes has been found in Humboldt Co. (Bald Mt., *Tracy* 4534).

121. C. rostrata Stokes. (Fig. 50). Cespitose and stoloniferous, the culms stout, phyllopodic, 3-12 dm. high, obtusely triangular and rough above the lowest spike; leaf-blades 2-12 mm. wide, the sheaths strongly nodulose dorsally and little if at all breaking and filamentose ventrally; staminate spikes 2-4, slender, 1-6 cm. long, 4 mm. wide; pistillate spikes 2-4, erect, remote, cylindric, densely many-flowered, sessile or short-peduncled, 3-15 cm. long, 6-20 mm. wide, the perignia spreading-ascending or at maturity spreading; lower bract exceeding culm; scales lanceolate, acute or awned, narrower than and from shorter to longer than perigynia; perigynia ovoid, 4-6 mm. long, 2 mm. wide, several nerved, membranaceous, inflated, round in cross-section, greenish straw color or darker tinged, abruptly beaked, the beak smooth, 1.5-2 mm. long, with erect or spreading teeth 1 mm. long or less.

Type Locality: Great Britain.

Swampy places; Labrador to Alaska, south to Delaware, New Mexico and California, where abundant in the Sierra Nevada and locally in the southern mountains; also collected near San Francisco by Bolander.

Locs.: Sonora Trail, *Brewer* 1871; Big Trees, *Hillebrand* 2312 (in part); Truckee River, *Bolander* 2161; Yosemite, *Bolander* 4968; Lake Tahoe, *Hall & Chandler* 4642; Truckee, *Heller* 7108; Walker Lake, Mono Co., *Congdon;* Placer Co., *Carpenter;* Silver Valley, *Brewer* 1966; Lake Tahoe and Bear Valley, *Bolander & Kellogg;* Summit Camp, *Kellogg;* Twelve-Mile House, San Jose R. R., *Bolander;* Placer Co., *Davy* 3270; Lake Tahoe, *Glenn;* Lake Bigler, *Brewer* 2157; Yosemite, *Brewer, Abrams* 5455; Mono Trail, *Bolander* 6197; Chico Meadows, Butte Co., *Heller* 11494; Ravell Meadow, Fresno Co., *Dudley;* Lake of Islands, *Dudley* 2384; Grant Park, *Dudley* 1225; Chagoopa Creek, *Dudley* 2271; Mountain Lake, *Dudley* 971; Hockett Meadow, *Dudley* 971*a*, 1020, 1859; Mt. Whitney, *Dudley* 2469; Heather Meadow, *Dudley* 1664; Cahoon Meadow, *Dudley* 1854; Squaw Valley, Placer Co., *L. S. Smith 7d*; Little Kern Lake, Kern River Cañon, *Jepson* 4940; San Francisco, *Bolander* 152; Sierra Nevada, *Lemmon;* Mineral King, *Coville & Funston* 1431; Truckee, *Hitchcock* 254; Bear Valley, *Parish* 1575; Eureka, Nevada Co., *N. T. Davis* 41; Yosemite, *Torrey* 545; Bear Valley, San Bernardino Co., *Abrams* 2850; Bishop Creek, Inyo Co., *Davidson* 2555; Giant Forest, Tulare Co., *Dudley* 2992.

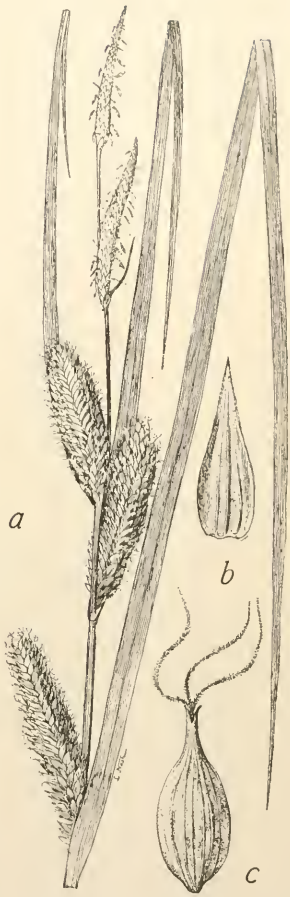

Fig. 50. Carex rostrata Stokes.
a, inflorescence, × 2/3; *b*, scale, × 5; *c*, perigynium, × 5.

Refs.: Carex rostrata Stokes in With. Arrang. Brit. Pl. (ed. 2) 2: 1059 (1787). *C. vesicaria* β L. Sp. Pl. 979 (1753), type from Lapland. *C. ampullacea* Good. Trans. Linn. Soc. 2: 207 (1794), type from England. *C. utriculata* Boott in Hook. Fl. Bor. Am. 2: 221 (1840), type from British America, *Dr. Richardson;* W. Boott in S. Wats. Bot. Cal. 2: 252 (1880); Parish, Bull. S. Cal. Acad. 4: 66 (1905). *C. rostrata* Stokes var. *utriculata* Bailey, Proc. Am. Acad. 22: 67 (1886); Kuk. in Engler, Pflzr. 4[20]: 722 (1909). *C. utriculata* Boott var. *minor* Boott, in Hook. Fl. Bor. Am. 2: 221 (1840), type from British America, *Dr. Richardson;* Parish, l. c.

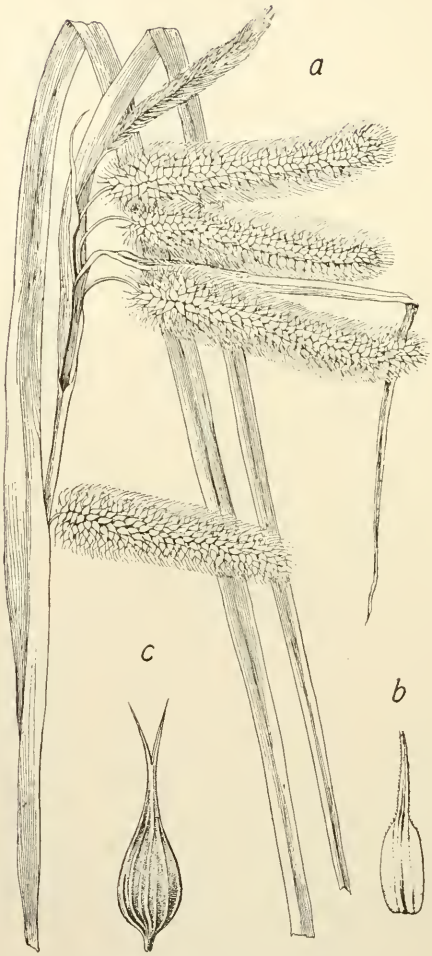

Fig. 51. Carex comosa Boott.
a, habit, × 2/3; *b*, scale, × 5; *c*, perigynium, × 5.

XXXIV. Pseudo-Cypereæ Tuckerm. Culms tall, generally stout, acutely angled, leafy below. Leaf-blades flat, septate-nodulose. Spikes 3-9, the upper 1-3 slender, staminate, the others normally pistillate, densely flowered, the upper approximate, the lower remote and strongly peduncled, often nodding. Bracts leaflike, much exceeding the culms, mostly not sheathing. Pistillate scales aristate. Perigynia spreading or reflexed, membranaceous or stiff, triangular or circular in cross-section, 3-8 mm. long, closely many-ribbed, greenish straw-color, smooth, stipitate, contracted into a rigid beak, the teeth slender. Achenes triangular, continuous with the slender often flexuous style. Stigmas 3, short.

122. C. hystricina Muhl. Cespitose and stoloniferous, the culms 3-9 dm. high, reddish-purple at the base, rough above; leaf-blades 3-8 mm. wide, the basal sheaths often breaking and filamentose; staminate spike 1-5 cm. long, 2.5-4 mm. wide, slender stalked, the scales rough-awned; pistillate spikes 1-4, approximate or strongly separate, densely many-flowered, oblong or oblong-cylindric, 1-6 cm. long, 10-14 mm. wide, the lower slender stalked; lower bract exceeding culm; scales green, 3-nerved, rough-awned, narrower and mostly shorter than perigynia; perigynia 5-6 mm. long, 1.5-2 mm. wide, finely 15-20 nerved, narrowly ovoid, ascending or at length spreading, greenish straw-color, rounded and short stipitate at base, tapering into a smooth bidentate beak 2 mm. long, the slender teeth erect.

Type Locality: "Habitat in humidis Pennsylvaniæ."

Swampy soil, New Brunswick to Alberta, south to Georgia, Texas, Arizona and northern California, where but recently collected in Trinity Co.

Loc.: Rush Creek, Trinity Co., *Yates* 423.

Refs.: Carex hystricina Muhl. in Willd. Sp. Pl. 4: 282 (1805); Kük. in Engler, Pflzr. 4[20]: 699 (1909).

123. C. comosa Boott. (Fig. 51). Cespitose and not stoloniferous, the culms stout, 5-15 dm. high, very sharply angled, strongly roughened to smooth; leaves very nodulose, the blades 6-14 mm. wide, flat with revolute margins, the basal sheaths not breaking and filamentose; staminate spike 3-7 cm. long, 4-7 mm. wide, slender-stalked, the scales rough-awned; pistillate spikes 1-4, densely many-flowered, oblong-cylindric, 1-6 cm. long, 12-14 mm. wide, the upper erect and short-peduncled, the lower slender-stalked and at length nodding; lowest bract exceeding culm; scales narrow, mostly shorter than perigynia, very rough-awned, greenish or brownish tinged; perigynia lanceolate, rigid, 5-7 mm. long, 1.5 mm. wide, greenish or brownish tinged, round-tapering and stipitate at base, closely many-ribbed, reflexed when mature, tapering into a smooth, very deeply bidentate beak with recurved spreading awns 1.5-2 mm. long.

Type Locality: "In Georgia et Carolina, (Elliott); Ohio, (Sullivant); Philadelphia et Utica, (Torrey); Boston, (Boott)."

Swamps, Nova Scotia to Minnesota, south to Florida and Louisiana and locally from Washington to California east to Idaho. In California it is known only near the coast from San Francisco northward, except for a stray plant collected in the San Bernardino valley.

Locs.: San Francisco, *Bolander* 2301 (in part); Blue Lakes, *Jepson* 26*a*, 26*b*; Guerneville, *Davy;* San Bernardino Valley, *Parish* (one plant only); Santa Cruz Mts., *Bolander* 69.

Refs.: Carex comosa Boott, Trans. Linn. Soc. 20: 117 (1846) Parish, Bull. S. Cal. Acad. 4: 67 (1905). *C. furcata* Ell. Sketch Bot. 2: 552 (1824), not Lapeyr. 1813, type from South Carolina. *C. pseudo-cyperus* L. var. *comosa* Boott, Ill. Car. 4: 141 (1867); W. Boott in S. Wats. Bot. Cal. 2: 252 (1880); Kük. in Engler, Pflzr. 4[20]: 696 (1909). *C. pseudo-cyperus* L. var. *americana* Hochst. ex Bailey, Mem. Torr. Club 1: 54 (1889), type from eastern North America. *C. pseudo-cyperus* L. var. *furcata* Kük., Allg. Bot. Zeitschr. 7: 195 (1901).

ADDITIONAL SPECIES.

15a. C. breviligulata Mackenzie n. sp. Culms 3-6 dm. high, exceeding leaves, rough above; leaf-blades 3-4.5 mm. wide, the sheaths tight, not conspicuously septate dorsally, thin-hyaline and more or less cross-rugulose ventrally, truncate at mouth; head 1.5-3.5 cm. long; bracts usually not conspicuous; perigynia 3.25-3.75 mm. long, ovate from a round-tapering base, green-margined, serrulate from middle, the beak half length of body.

Type Locality: Grants Pass, Oregon (Henderson) 1477.

Marshes and swales: North Coast Ranges; Sierra Nevada. North to Oregon.

Locs.: Round Valley, Mendocino Co., *Chesnut* 285; Susanville, *Jones;* North Fork, Fresno Co., *Griffiths* 4479; Santa Rosa, *Wooton.*

Refs.: Carex breviligulata Mackenzie. *C. vicaria* var. *costata* Bailey, Mem. Torr. Club 1: 49 (1889).

50a. C. montereyensis Mackenzie n. sp. Culms 8-10 dm. high; leaf-blades 2.5-3 mm. wide; head 1.5-2.5 cm. long, the 8-12 spikes closely aggregated, ovoid, 6-9 mm. long, the perigynia ascending; scales narrowly ovate; perigynia ovate, 3.25 mm. long, tapering into a beak half length of body.

Type Locality: Pacific Grove (C. P. Smith, 1055, type).

Known only from pine-forests, in the lowlands, Monterey coast.

Loc.: Pacific Grove, *Heller* 6786.

76a. C. flaccifolia Mackenzie n. sp. Culms 6-9 dm. high; leaf-blades about 3 mm. wide; staminate spike 1-2.5 cm. long, short-peduncled; pistillate spikes mostly three, approximate or somewhat separate, sessile or short-peduncled, 1-2.5 cm. long, rather loosely 8-25-flowered; scales ovate, cuspidate; perigynia short-tapering at base, the beak 0.5 mm. long, bidentulate.

Said to have been collected on dry plains in southwestern California (Geo. B. Grant, May 1, 1902, type in the U. S. National Herbarium).

INDEX TO CAREX

ablata, 65, 64
  var. luzuliformis, 66
Abramsii, 64
abrupta, 45
acuta, 80
  var. pallida, 76
acutina, 80
adusta, 38, 39, 46
  var. congesta, 48
aematorhyncha, 86
aequa, 69
albida, 64
albo-nigra, 71
alma, 28
alterna, 26
amplectens, 47
amplifolia, 67
ampullacea, 89
angustata, 79, 80
angustior, 35
aquatilis, 76, 82
  var. dives, 76
  var. pachystoma, 76
arcta, 50
arida, 43
athrostachya, 43
  var. minor, 44
atrata var. nigra, 70
  subsp. atratiformis, 71
  var. erecta, 71
aurea, 58
  var. androgyna, 58
  var. celsa, 58
auriculata, 79
austromontana, 79

barbarae, 77, 78
Bernardina, 31
bicolor, 58
bifida, 69
Bishallii, 79
Blankinshipii, 62
Blyttii, 49
Bolanderi, 37
  var. sparsiflora, 32
Bonplandii, 44
  var. angustifolia, 32, 36
  var. minor, 36
brachypoda, 73
Brainerdii, 54
brevicaulis, 56
breviligulata, 92
brevipes, 55
Breweri, 18
bromoides, 37
Brongniartii, 29, 30
  var. densa, 29
Buxbaumii, 69

californica, 59, 58
camporum, 26
canescens, 49, 48
  var. dubia, 50
  var. oregana, 50
  var. polystachya, 50
  var. robustior, 50
capitata, 22
celsa, 58
cherokeensis, 64
chrysoleuca, 29
cinnanomea, 64
columbiana, 72
comosa, 91, 76
concinnoides, 56
concolor, 73
Congdonii, 84
cristata, var. mirabilis, 38
cryptocarpa, 87
curta, 50
Cusickii, 31, 30

Davyi, 42
debiliformis, 64
decidua, 75, 76, 80
deflexa, var. Boottii, 55
  var. Farwellii, 56
  var. media, 56
  var. Rossii, 56
densa, 29, 32
Deweyana, 36, 37
  var. Bolanderi, 37
  var. sparsiflora, 34
diandra, 31
  var. ampla, 32
disperma, 49
disticha, 29
dives, 74

Douglasii, 24, 26
  var. brunnea, 26
  var. densi-spicata, 24
  var. laxiflora, 24
  var. minor, 24
Dudleyi, 30

echinata, 35
  var. angustata, 36
  var. ormantha, 35
egregia, 81
elata, 80
Engelmannii, 18
epapillosa, 70
eurycarpa, 80
  var. oxycarpa, 81
exserta, 52
exsiccata, 88
  var. globosa, 88
  var. pungens, 88

Farwellii, 56
Fendleriana, 24
festiva, var. decumbens, 44
  var. gracilis, 48
  var. Haydeniana, 44
  var. pachystachya, 45
  var. stricta, 30, 40, 45, 47
festivella, 44
feta, 38
filifolia, 53
  var. erostrata, 53
filiformis, var. aematorhyncha, 86
  var. latifolia, 86
filipendula, 81
fissuricola, 66
flaccifolia, 92
flava, var. recterostrata, 87
  var. viridula, 87
foetida, 23, 30
  var. stricta, 30
  var. vernacula
fracta, 38
frigida, 65
fulva, var. Hornschuchiana, 64
furcata, 91
fusca, 70

Gayana, 24
var. hyalina 26
Geyeri, 51
gigas, 53
globosa, 54, 53
var. brevipes, 55
glomerata, 29, 30
gracilior 48, 47
Grayana, 59
gymnoclada, 73
gynodynama, 61

Halliana, 85
Hallii, 80, 85
Harfordii, 47
Hassei, 58
Haydeniana, 44
Haydenii, 44
Helleri 70
Hendersonii, 60
heteroneura, 71
Hindsii, 75
var. brevigluma, 76
hirtissima, 62
Hoodii, 26, 29
var. nervosa, 27
Hookeriana, 26, 27
Howellii, 76
hypoxanthus, 30
hystricina, 91

illota, 36, 32
incurva, 23
inops, 54
integra, 46
interior, 34
interrupta, var. impressa, 75
invisa, 68
irrasa, 24

jacintoensis, 74
Jamesii, 74, 79
var. austrò montana, 79
var. nebraskensis, 74
Jonesii, 32

Kelloggii, 75
Kunzei, 48

laciniata, 78
lacunarum, 78
laeviculmis, 34
lagopina, 50
lagopodioides, 38
lancifructus, 43
lanuginosa, 85, 86
lasiocarpa, var. lanuginosa, 86
latebrosa, 26
laxiflora, var. plantaginea, 60
Leersii, var. augusta, 36
Lemmonii, 64, 69
lenticularis, 75, 76
var. paullifructus, 76
leporina, 41, 42
var. americaua, 42
leporinella, 42
leptalea, 50
eptopoda, 36, 37
Liddoni, var. incerta, 48
limnaea, 76
limosa, var livida, 59
livida, 59
luzulaefolia, 65, 66
var. ablata, 64, 65, 66
var. strobilantha, 66
luzulina, 64
Lyallii, 68
Lyngbyei, 81

macloviana
var. Haydeniana, 44
var. pachystachya, 44, 45
var. subfusca, 40
Macounii, 81
magnifica, 82
var. lacunarum, 78
marcida, 26
var. alterna, 26
mariposana, 45
Meckii, 24
mendocinensis, 63
Mertensii, 72
microstachya, 50
monile, 88
var. colorata, 88
var. pacifica, 88
montereyensis, 92
monticola, 63
multicostata, 40
muricata, var. confixa, 27
var. gracilis, 27
mutica, 56

nebraskensis, 73
var. praevia, 74
var. ultriformis, 74
nervina, 33, 45
var. Jonesii, 32
nigricans, 22
novae-angliae, var. Rossii, 56
nubicola, 44
nudata, 79, 80
var. anomala, 78
Nuttallii, 24

obnupta, 81
Oederi, 87
var. viridula, 87
olympica, 45
oregonensis, 84
ormantha, 35
owyheensis, 65
oxycarpa, 80

pachycarpa, 48, 39
pachystachya, 44
pachystoma, 76
paddoensis, 18
paniculata, 29, 32
pansa, 25
paucicostata, 74
paucifructus, 48
pellita, 86
petasata, 42
phaeocephala, 41
phyllomanica, 35
phyllostachys, 51
pilosiuscula, 61
podocarpa, 68
polygama, 70
polymorpha, 60
var. californica, 60
polytrichoides, 50
praegracilis, 25
pratensis, 41
praticola, 40
Prescottiana, 78
Preslii, 42, 46
propinqua, 48
pseudo-cyperus, var. americana 89
var. comosa, 91
var. furcata, 91
pseudo-japonica, 66
pyrenaica, 22
pulchella, 80
pyriformis, 58

quadrifida, 71
var. caeca, 71
var. lenis, 71
qualicumensis, 81

Raynoldsii, 68
Richardsonii, 57
rigida, 73
romanzowiana, 81
Rossii, 55
var. brevipes, 55
rostrata, 89, 86, 88
var. utriculata, 89

salina, 58
var. minor, 58
var. robusta, 81
salinaeformis, 57
Sartwelliana, 84
Sartwellii, 84
Schottii, 78, 82
scirpoidea, 35
var. gigas, 53
scirpoides, 35
scoparia, var. fulva, 39, 43
scopulorum, 72, 73
Scouleri, 81
senta, 78, 80
serratodens, 64, 69
Sheldonii, 86
siccata, 26, 42
simulata, 24
sitchensis, 76, 82
specifica, 42, 39, 40
spectabilis, 67
spissa, 83
stans, 76
stellulata, 35
var. angustata, 36
var. ormantha, 35
var. scirpina, 35
var. scirpoides, 35
stenoptera, 28
sterilis, 35
var. angustata, 36
stipata, 33
straminea, var. congesta, 39
var. mixta, 38
straminiformis, 39
stricta, 80
sub-bractcata, 47
subfusca, 40, 30
subspathacea, 58
subulata, 70

tenella, 49
tenerae formis, 46
tenuirostris, 42, 44
teretiuscula, 31, 32
Tolmiei var. invisa, 68
var. subsessilis, 73
Tracyi, 41
trichocarpa, var. imberbis, 88
triquetra, 62
tumulicola, 27
umbellata, var. globosa, 54
unilateralis, 43
Urbanii, 87
usta, 26
utriculata, 89
var. minor, 89

vallicola, 35
variabilis, 76
verecunda, 54
vernacula, 23, 30
vesicaria, 87
var. colorata, 86
var. globosa, 88
var. lanccolata, 88
var. major, 88
var. obtusisquamis, 88
var. pacifica, 88
vicaria, 30, 29
viridula, 86
vitrea, 29
vulgaris, var. alpina, 73
var. bracteosa, 73
var. juncella, 76
var. lipocarpa, 76
vulpinoidea var. vicaria, 30

Watsoni, 84
Whitneyi, 61
Wilkesii, 78

xalapensis, 29

Yosemitana, 83

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